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# THE PREHISTORIC RUINS OF THE SAN JUAN WATERSHED IN UTAH, ARIZONA, COLO- RADO, AND NEW MEXICO

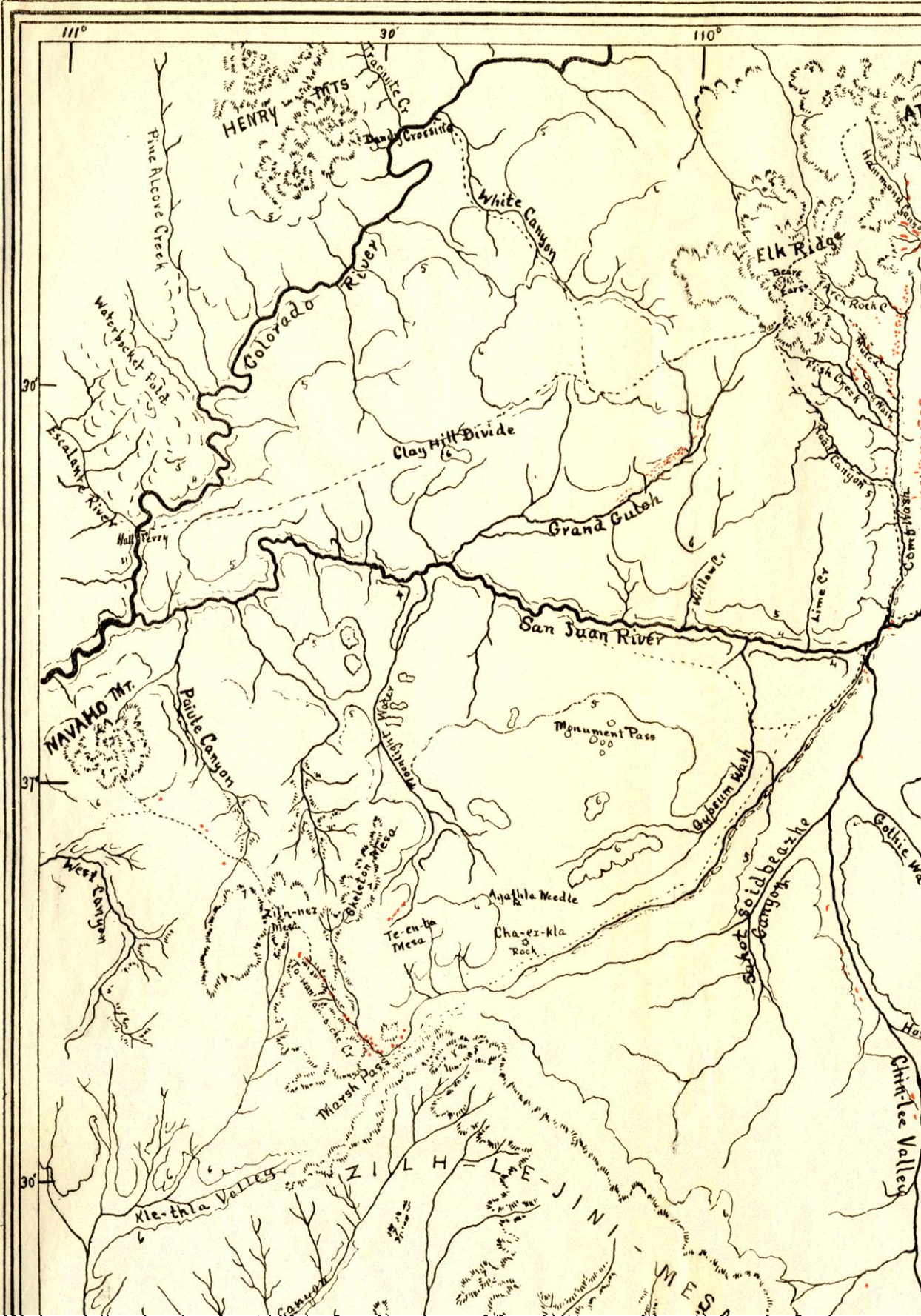
BY T. MITCHELL PRUDDEN

## INTRODUCTION

In a survey of the widely scattered stone ruins of the southwestern United States which mark a prehistoric occupancy of regions now arid and mostly deserted, it is both convenient and instructive to recognize large natural districts corresponding to the great drainage areas. Such districts are the watersheds of the Gila and its tributaries, of the Little Colorado, of the Rio Grande, and of the Rio San Juan. The ruins in each of these districts are marked by peculiarities of construction and grouping, by apparent differences in age, and by types of pottery, fabrics, and utensils, all of which appear to be of considerable significance in the attempt to characterize these early American Indians and to trace the lines of their relationship to one another and to existing tribes. When each of these districts shall have been carefully studied and compared, and not until then, will the data be at hand for wide generalizations regarding the origin, relationships, and period of occupancy of these house-building people.

Aside from the structural differences between the prehistoric ruins in the San Juan watershed and those to the south and east, there is a certain fitness in a separate consideration of the San Juan district, because so far as I am aware there is no historic record of early Spanish visitation here and no evidence of Spanish influence, either in the type of building or in the utensils and pottery which excavations here and there have brought to light.

Many of the larger individual ruins and some of the more important groups in the San Juan country have been already described. These will be merely mentioned in the text with suitable reference. But aside from these there are several regions in this great water-







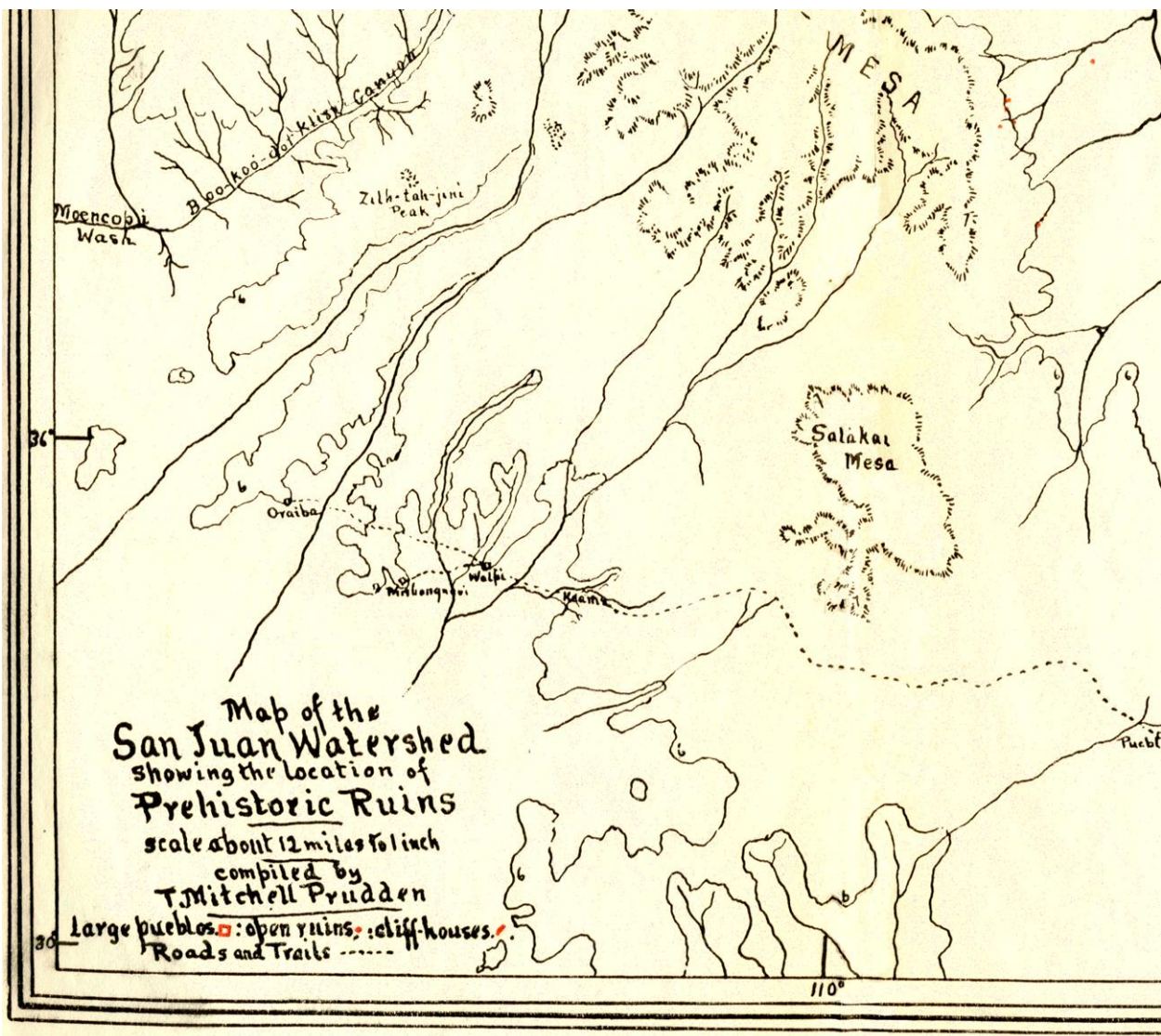


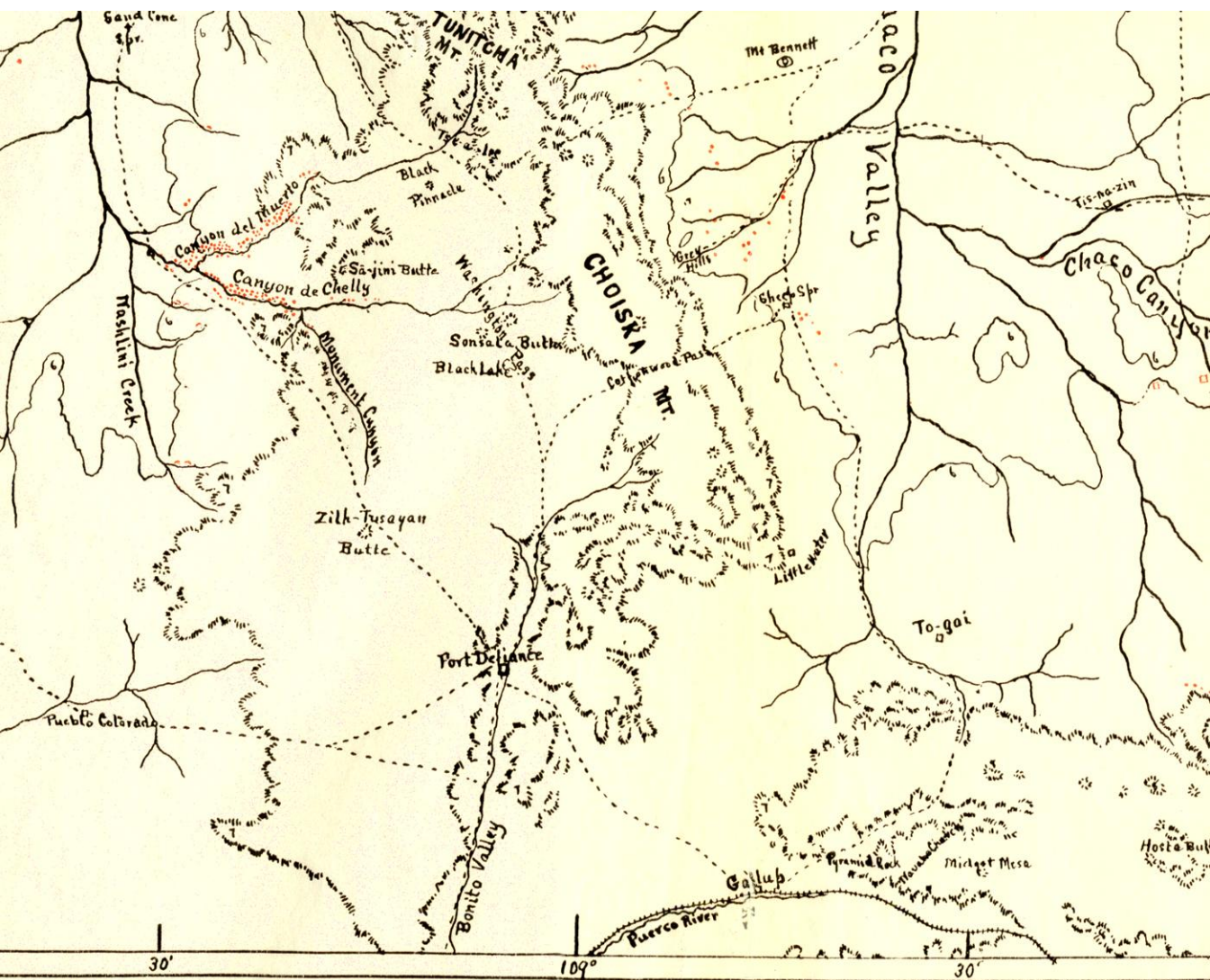




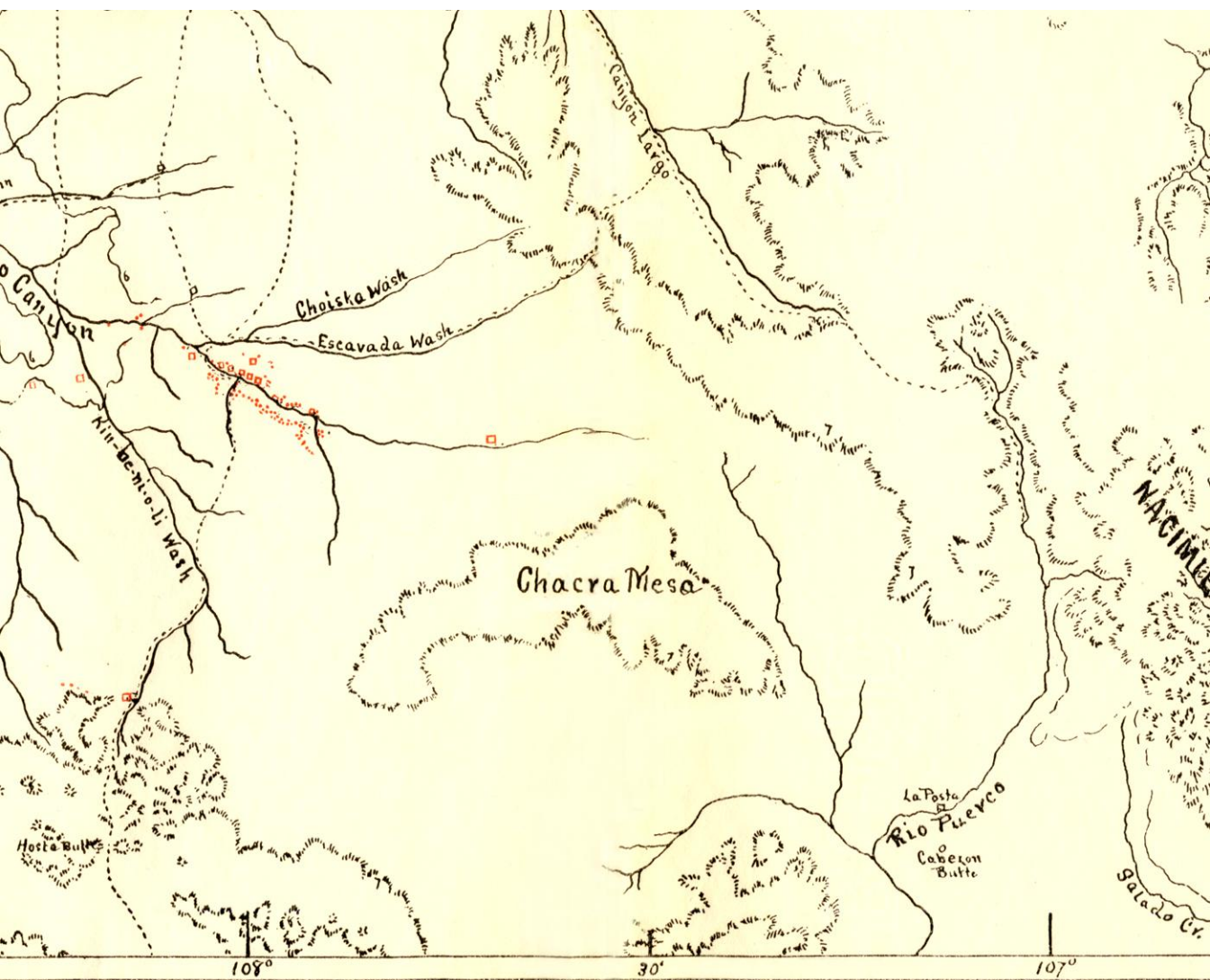


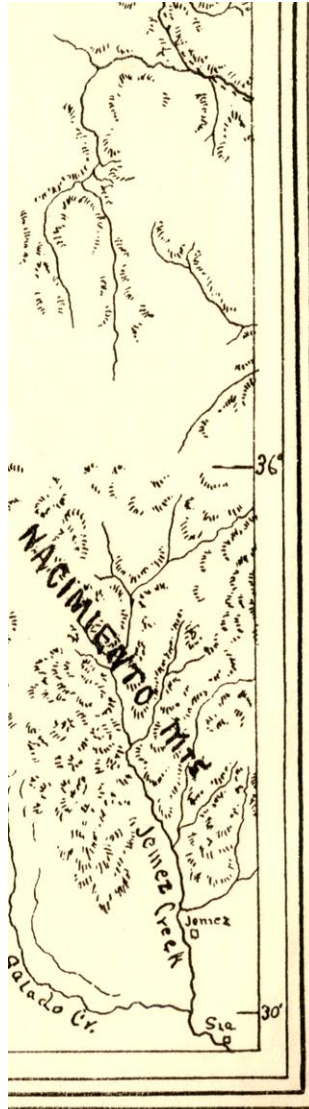














shed, most of them quite inaccessible, some of whose ruins have been visited by local curiosity seekers and professional "pot-hunters" but are otherwise unknown save to the cattle-herders and the Navaho Indians.

The writer has for several years spent the summer months in a reconnoissance of the San Juan watershed, which lies in the contiguous districts of Utah, Colorado, Arizona, and New Mexico, locating and determining the general characters of the ruins which are abundant in many parts of the region.

The chief purpose of the accompanying map (plate xvi) is to show the number, location, and grouping of the prehistoric ruins in the district. The aim of the brief descriptive text is to record the writer's observations on the type, size, and degree of preservation of the ruins in the various groups; the extent to which their burials have been disturbed; their relationship to arable land and water supply; their association with pictographs; and, finally, to indicate some of the features of the remoter and less known groups which seem to urge their systematic study under the direction of competent archeologists.

#### CHARACTERS OF THE SAN JUAN COUNTRY

The San Juan country is so isolated and so little traversed that a few words as to its situation and characters seem desirable.

For two hundred miles the rugged deeps of the great Canyon of the Colorado bar the way across the continent. The transcontinental railroads and the old trails which they have largely usurped swing far to the north or far to the south to shun the chasm which no bridge may span. Thus it is that on either side of the great Colorado Canyon lie vast stretches of the plateau country, unsettled and unvisited save by cattle-men and certain tribes of Indians, mostly Navahos, Utes, Paiutes, and Hopis. It is through this mighty tableland which has parted the ways of travel for so many years and held almost inviolate its primeval solitudes that the San Juan river makes its way westward.

The San Juan and its northern tributaries, the Navaho, the Piedra, the Pine, the Animas, and the Mancos, rise in the San Juan Mountains in Colorado from ten to twelve thousand feet above the

level of the sea (see relief map, plate xvii).<sup>1</sup> The San Juan soon leaves the mountains and winds westward through a sun-baked valley. From the south it is joined by three great tributaries, the Largo, the Chaco, and the Chin-lee, whose broad rugged valleys and imposing stream-beds for nine months of the year are almost wholly dry. From the north the San Juan receives a few dry washes or creeks, the McElmo, Montezuma, Recapture, Cottonwood, Butler, Comb, and Grand Gulch. At length it enters a sheer-walled canyon, more than a thousand feet deep, which, with breaks at intervals, it holds for some forty miles until it sweeps into the great Colorado canyon, two thousand feet below the plateau but still four thousand feet above the level of the sea.

As a mountain stream the San Juan is clear and sparkling. But after it reaches the long valley bottom from two to five miles wide through which it flows westward, it is usually muddy, sullen, and treacherous, abounding in quicksands, changing its bed and bottom with every flood, and washing out and filling in the soil from side to side.

In the more open reaches of the river cottonwoods flourish and huge gravel benches rise on either hand from the alluvial bottom, while back of these great buttes and cliffs mark the vast erosion of earlier times.

The maps, such as they are, of the San Juan River country are very deceptive in the matter of streams. It is a brave showing of tributaries which the river makes on paper in its journey of three hundred miles. But in fact, of the twenty and more which meander across the maps, only the five streams which I have named from the mother mountains carry water except in flood time. The rest are either dry, well-nigh impassable chasms or gulches, or they are rivers of dry sand the summer through, save after some cloudburst in the hills. In the thirty thousand square miles of the San Juan watershed, only in the river itself and in its tributary streams from near its own sources, or in widely scattered springs and pools, is water to be found in summer. So in spite of the illusion of the maps, the great plateau country, here as elsewhere, is brown and dry and waste.

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<sup>1</sup> The vertical scale of this relief map was exaggerated about 20-1 in the wax model.





RELIEF MAP OF THE SAN JUAN DRAINAGE AREA.

After model by T. Mitchell Prudden. Scale, approximately 50 m. to 1 in. Vertical exaggeration, 1-20.

In some portions of the San Juan country there are roads which make a few of the ruins accessible by wagon. But the larger part in the remoter regions can be reached only on horseback and with a pack-train sufficiently large to carry provision for trips of two or three weeks' duration.

The old trails may at times be followed and kept alive by the Indians or cattle herds, and often lead from one ruin to another. But the way is for the most part trackless, and hardy well-trained animals are essential for the rough scrambles up and down the canyons and for the long thirsty rides which often lie between water and water.

In the northeastern corner of the San Juan country, where the living streams come down from the great mountains, are a few towns and some small farming hamlets, while scattered along the narrow valley bottom of the San Juan itself are several fruit-raising villages. The Navaho Indian reservation lies mostly within this watershed, occupying its southwestern segment. But the larger part of the region is tenantless today.

The altitude of that portion of the Great Plateau occupied by the San Juan watershed varies greatly. The San Juan enters the Colorado at about four thousand feet above the sea (see relief map, plate xvii). The larger valley bottoms are five and six thousand feet high; the great mesas range from seven to eight thousand feet. Above these the summits of the Sierra Abajo, Sierra El Late, and the long composite range formed by the Carriso, Luckachucki, Tunitcha, and Choiska rise to ten and eleven thousand, while the lofty spires of the La Plata and those of the great San Juan group reach twelve and thirteen thousand feet. The massive Cretaceous sandstone strata have been tilted near El Late (Ute Mountain) and Abajo, and a great fault runs from the latter a little west of south along Comb Wash and crossing the San Juan bears off toward Marsh Pass. It is these breaks and local uplifts together with the great waterworn canyons which, save in the broad valleys of a few of the larger streams, give the country its imposing ruggedness.

Spruce, pine, piñon, and cedar flourish upon the higher hills and mesas, while upon the lower levels scrub-oak, sage-brush, and greasewood stretch for miles over the rocky slopes and along the broad

arid valleys. The thick-leaved and the narrow-leaved yucca, mesquite, and various forms of cactus are abundant in many regions. Along the water-courses scrub-oaks, cottonwoods, aspens, and willows lend a touch of greenness to the general dull brown and red. Now and then the bottom lands are tinged with green from coarse weeds which carpet them, but save in the mountains green is scanty except in the spring and after the rainy season when tufted grass spreads over the favorable bottom lands, along the moister sags in the mesa tops, and up the lower slopes of the mountains.

Extensive coal beds are exposed here and there in many parts of the watershed. West of the Luckachucki one may ride for miles over a fallen petrified forest. On many long and weary stretches the sand lies in vast billows or drifts before the wind in blinding clouds, or in stately whirling columns rises high in the air. The swish and roar of these sand-pillars as they rush by before the wind is one of the few sounds which break the general silence of these desert reaches of the Great Plateau.

It is very hot and dry in summer all over this section of the country. The high, wind-swept mesa tops are bleak and forbidding in winter. But in the sheltered valleys and along the southern faces of the canyon walls the winter climate was happily tempered to the habit and requirements of the sun-loving aborigine whose life though adapted to stuffy houses and sheltered nooks was spent chiefly out of doors.

#### THE MAP

The map is based largely on the topographic maps of the United States Geological Survey which have been reduced by photography and retraced. Since, however, some of the sheets, especially those of the country north of the San Juan, are only the results of early reconnoissance surveys and are not sufficiently accurate in certain minor details, it has been necessary in some regions to redraw the map on the basis of my own field observations. These revisions are not topographically accurate, but they represent the relationship of stream-beds so closely that the writer is confident that any worker in the field can locate the ruins upon them. The Survey sheets of some portions of the upper San Juan watershed are still unpublished, and the data for these regions have been gleaned from various sources



and corrected by field work. The aim in the outline map has been primarily to indicate the drainage, with rather general suggestions taken from the Government surveys of thousand-foot contours.

#### THE METHOD OF EXPLORATION

The method adopted to secure reasonable completeness in the search for ruins in this vast country has been to find in each region under survey, whenever this was practicable, some person who was familiar with the territory, whether large or small, and to attach him to my party. In some cases, in regions not far from the settlements, some one among the ranchmen could always be found who had been interested in these striking objects and had spent much time in visiting them. More frequently in the northern San Juan country it was found advisable to enlist the services of cattlemen, some of whom spend a large part of the year ranging over the great plateaus, either herding the cattle in their charge or seeking for "strays." These men, long in the business, often develop a remarkable acuteness and repeated experiences have shown that the observant cattle-ranger is apt to know all the important ruins in his district.

In the south country, one or two Navaho Indians were almost always joined to our party, and they too, if one be critical in the selection, are often extremely well-informed as to the situation of ruins. When no person acquainted with the region to be traversed was at hand, the well-known skill and resourcefulness of my constant associates in these wanderings, the Wetherills, and especially Clayton Wetherill,<sup>1</sup> were largely drawn upon in the independent search for ruins.

Thus through the employment of a large number of helpers, each well acquainted with his limited region, and by the thorough exploration with these as well as without them, it may be assumed

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<sup>1</sup> I wish here to express my appreciation of the invaluable services of Clayton Wetherill. His wide knowledge of the country and the conditions under which alone the long journeys into these desert regions may be successfully accomplished; his large experience in the search for ruins; and his cheerful helpfulness under all the vicissitudes and hardships of the way have largely contributed to the scientific value of this research and to the pleasure with which each day's achievement has been linked.

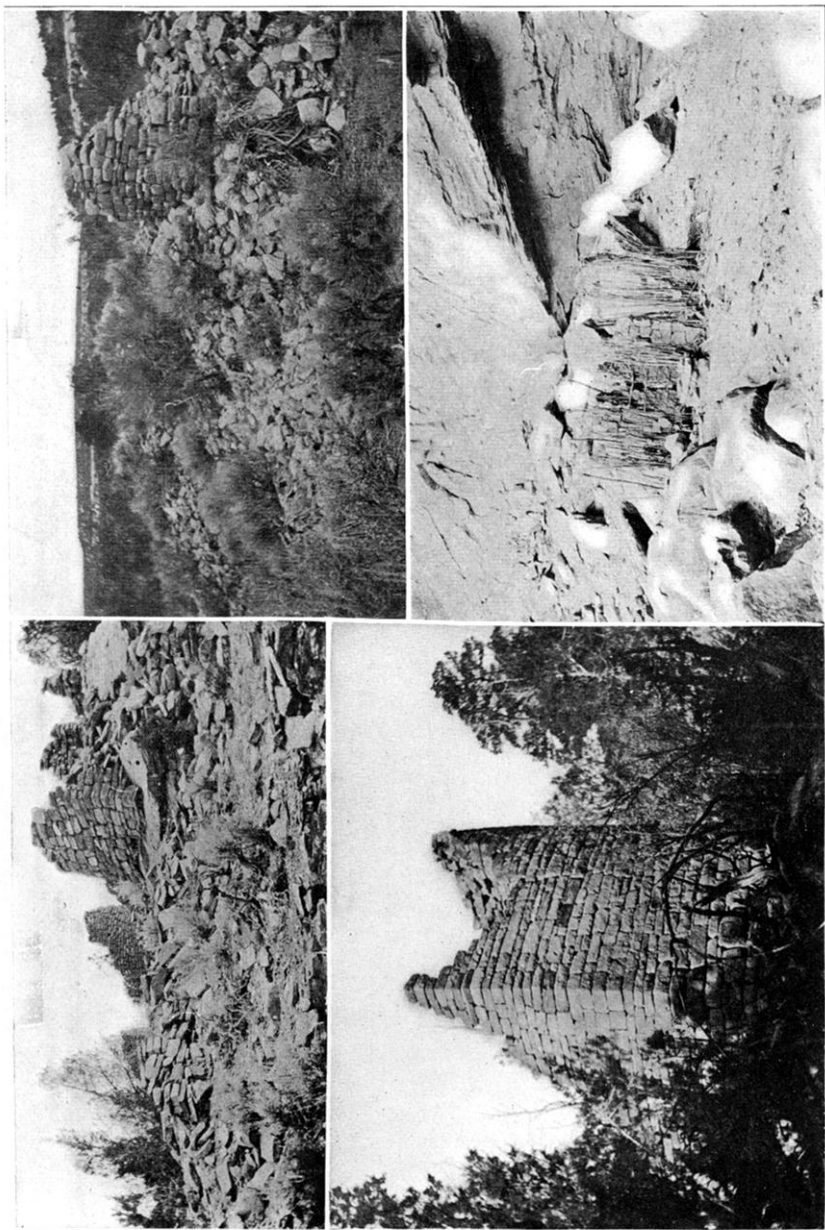
that practically all of the larger ruins and most of the smaller ones in the San Juan watershed have been visited by the writer and are indicated on the map. Of course, some tracts have not been traversed, and in the most carefully explored regions the lines of the trails often lie far apart. But considerable experience in this field leads one to a fairly accurate judgment as to the situations in which ruins may or may not be. Thus there are large bare uplands, many square miles in area, and broad, sandy, sun-baked desert valleys which after a comparatively brief search may be safely dismissed as untenanted.

Every valley to the north and the south of the San Juan has been traversed by the writer and his parties, those to the north with especially great care. Most of the great mesas also between the valleys have been searched by the writer in person and by his associates. It is, however, probable that on many of the great piñon-clad uplands there are still small houses which have escaped discovery.

There are throughout the San Juan country, as well as in adjacent districts, many small, scattered, artificial stone-heaps and remains of small, isolated, single-room buildings, sometimes near, sometimes remote from well-defined house ruins. Such structures I have not indicated on the map. All of the ruins located on the map are such as from size or manifest evidence of occupancy, such as pottery, burial mounds, etc., have certainly been used as dwellings, or presumably as outlook towers or defensive structures.

I shall first make some brief statements regarding the general characters and structural types of the ruins in the San Juan region and shall then describe the ruins and ruin groups in the various districts throughout the entire watershed—first, those along the San Juan itself, then those in the northern, and, finally those in the southern sections.

I have not attempted in this brief summary of the ruins of this great district to give detailed descriptions, but only to bring together, in the simplest fashion, the data for a comprehensive inventory which may be useful in further studies in this or in other regions of the ruin area in the Southwest.



1. Group of open ruins, partly fallen, on the Yellowjacket, opposite mouth of Dawson Creek, Colorado. 2. Square building on the slope of Yellowjacket Canyon, opposite mouth of Dawson Creek. 3. Small open ruin with portion of standing wall, overlooking Nigger Canyon in the Yellowjacket group. 4. Small structure of jacal and adobe on the floor of a large cave in Grand Gulch, Utah.



## GENERAL CHARACTER OF THE RUINS

The ruins in the San Juan watershed vary greatly in size, form, and situation. Thus some of them are so large as to contain several hundred rooms (plate XXV, 1; XXVI); others consist of a single enclosed chamber or of a simple tower (plate XVIII, 2). Some stand upon commanding summits; some at the edges of the great mesas (plate XXIV, 3), or in the sheltered valleys at their feet; others, again, are built in caves (plate XXXII, 1) or along sheltered ledges on the faces of the cliffs (plate XXVII, 1).

While it is sometimes convenient to speak of valley dwellings, mesa dwellings, cliff dwellings, and cave dwellings, there appears to be no reason for believing that these distinctions are of deeper significance than marks of an adaptation to their environment of a house-building people lingering in the higher stages of savagery.

Although a knowledge of the actual number of ruins in this section, as well as their grouping, is of intrinsic value in an estimation of the problems which this phase of American archeology presents, there is no reason for believing that the number of ruins affords an exact indication of the populousness of the region at any one time, because the present condition of the ruins seems to point to very great differences in age. Thus, some of the houses, even though standing in exposed situations on the storm-swept summits of the mesas, show still the weathered roof and floor timbers either in place or fallen in upon the shattered walls; while, on the other hand, many of the ruins near by are reduced to formless heaps, and are covered deep with the wear and weather of their stones and by the drift of the sand-laden winds.

Furthermore, excavations which have been made in several places show that buildings, themselves of great age, have been made on the top of still older structures. Finally, as will be shown later, distinctly different structural types of buildings may be found in associated groups which point to a long or an interrupted occupancy of the site.

The material of which the ruins are built is mostly stone, and the nature of the latter depends on the character of the nearest available source. The Cretaceous sandstones from the buttes and cliffs and canyon walls are most frequently cracked into blocks or slabs

(plate XVIII, 1) and laid up with considerable skill, sometimes with, sometimes without adobe mortar. The free surfaces of the walls are often trimmed flat (plate XVIII, 2) and sometimes ground smooth. In some cases, notably in the ruins of the Chaco region, the stability and finish of the masonry is noteworthy (plate XIX). But in localities in which stratified rock is not at hand, as along the river bottoms far from the ledges, boulders from the stream-bed are almost wholly used and are laid up with a large amount of adobe. In such cases the weathering has reduced the ruins to heaps of rounded stones in which the outline of the walls is often not easily traced. Such boulder sites are the prevalent form of ruins along the San Juan and La Plata rivers and in the upper Mancos Valley.

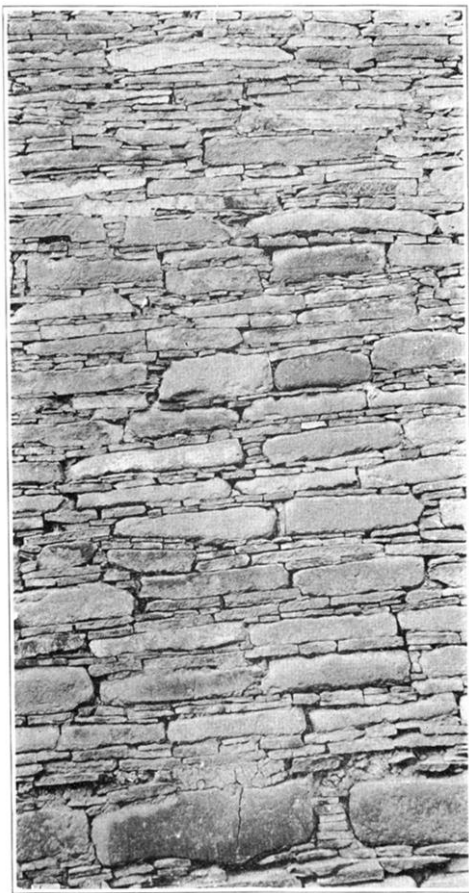
Having indicated these two forms of building material—cracked sandstone and boulders—it will not be necessary for the purposes of this paper to enter upon further detail of the masonry or of other structural features, since these are abundantly discussed in special works. It should be stated, however, that while the material of the “cliff” ruins is similar to that just described, in a few cases there are small ruins on the benches of shallow caves which are made of jacal; that is, of loosely woven upright and cross withes and rods (plate XVIII, 4) covered in with thick layers of adobe. These, however, were probably of later origin than the more typical and common cliff ruins with which they are associated.

While in the larger proportion of cases the roofs and floors have disappeared from the exposed ruins, in some instances, notably in many large cave ruins and in the large pueblos such as those of the Chaco Valley and at Aztec on the Animas, these though often fallen are still well preserved. On the high plateaus north of the San Juan, a few of the larger exposed ruins have partially preserved roof-timbers fallen in upon the walls. I do not remember to have seen, among the many hundreds of small exposed ruins of the simplest older type widely scattered over the country and presently to be described, one in which the roof or floor timbers are preserved.

#### CLASSIFICATION AND STRUCTURAL TYPES OF RUINS

Nearly all writers on the ruins of the Southwest country who have been themselves field observers have been impelled to make





PORTION OF THE WALL OF CHETTRO-KETTLE PUEBLO IN THE CHACO GROUP, NEW MEXICO, SHOWING EXCELLENT TYPE OF MASONRY.

more or less elaborate classifications of the ruins, and these for purposes of description are not only useful but almost indispensable. But the more familiar one becomes with these structures and the larger his field of comparison, the less stress, I think, will he lay upon the intrinsic significance of such classifications.<sup>1</sup>

For purposes of description, then, it is convenient to group the ruins of this country into several classes, with the understanding, however, that these indicate structural types often at least dependent upon local environment, and not intrinsic or especially significant differences.

The attempt to establish typical architectural forms in the buildings of these ancient people is beset with practical difficulties, owing to the frequent special adaptation in material and in form to particular situations as well as to the skilful incorporation of natural objects, such as caves, benches, cliffs, and fallen rocks, into the structure of the buildings.

I. One may, however, conveniently place in a class together those ruins which stand in the open, either in the valley bottoms or upon the mesas. The ruins standing in the open fall naturally into four groups: First, small isolated or clustered houses or pueblos, each conforming to a distinct primitive type presently to be described; second, irregular and often rambling groups or clusters of houses, usually adapted in form and position to peculiarities of their situation, such as the heads of gulches, the brinks or slopes of canyons, the tops of rocks or isolated buttes, etc.; third, towers and other isolated structures usually standing alone and frequently commanding wide outlooks; fourth, large communal pueblos forming compact, many-roomed buildings.

II. On the other hand, it is convenient to bring together in a second class those ruins which are more or less protected by their situation in shallow natural recesses or caves or upon overhung benches on the faces of the cliffs. Such ruins may stand singly or in small clusters or may be massed to form communal dwellings of

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<sup>1</sup>The most noteworthy of such classifications are that of Bandelier in the *Papers of the Archaeological Institute of America*, American series, IV, p. 27; that of Nordenskiöld, *The Cliff Dwellers of the Mesa Verde*, pp. 9, 113; and that of Mindeleff, *Sixteenth Annual Report of the Bureau of Ethnology*, p. 93.



considerable size. The houses of this group are commonly called "cliff dwellings."

The so-called "cave dwellings"—or cavate lodges—of which there are but few and these not well defined representatives in the San Juan watershed, are artificial caves dug out of soft rock. Such artificial caves often formed only a part of the dwelling, being frequently in communication, through narrow doorways, with stone structures built against the faces of the soft cliffs in which the caves were dug.

#### I. RUINS STANDING IN THE OPEN

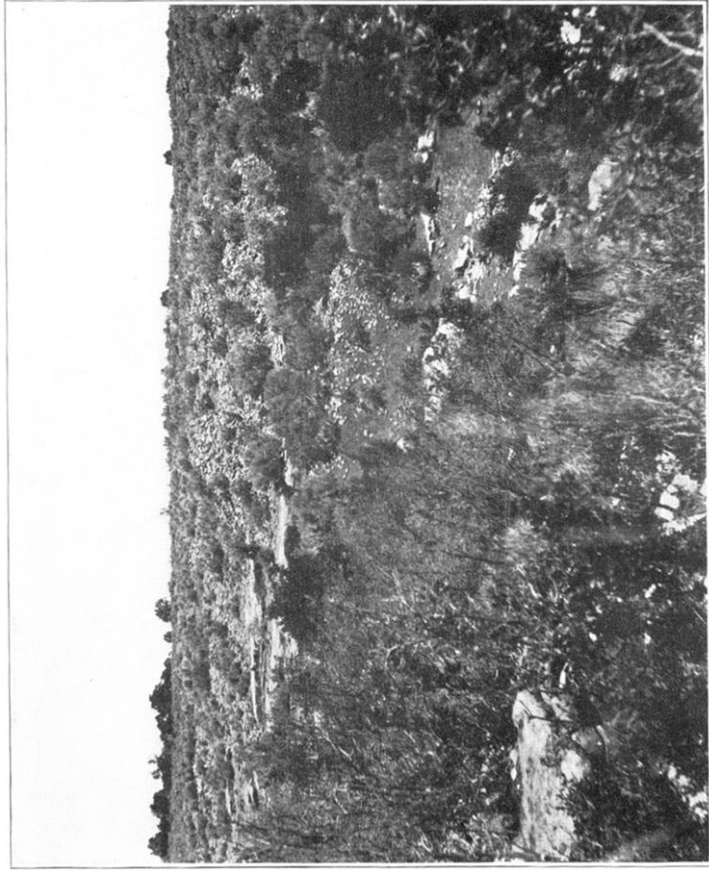
##### I. RUINS ON APPROXIMATELY LEVEL AND UNENCUMBERED SITES

Early in my studies I gained the impression that the most typical forms of buildings were to be sought in such situations as offered no incumbrances and no adventitious structural adjuncts—such situations, in short, as are found in the open level bottoms or on the approximately level mesa tops.

I found, in fact, that among the smaller ruins which stand in the open, either in the valleys or on the mesas, there is one type which is by far the most abundant and widely distributed, especially north of San Juan River. These ruins are usually fallen (plate XVIII, 3) and are often more or less overgrown with sage-brush or other low shrubs (plate XXI, 2), so that unless the walls are partly standing they form irregular and often inconspicuous stone heaps. They are, however, almost invariably composed of three elements—a series of chambers forming the house, an *estufa* or *kiva*, and a burial mound. Such ruins constitute at least nine-tenths of all these smaller isolated structures.

The house in this type of ruin in its simplest form consists of a single row of rooms, each usually five or six feet wide and from eight to ten feet long, with a straight wall upon the back, and a short, right-angled wing at each end: the whole forming approximately one side of a square. This usually opens southward, with an *estufa* occupying the partially enclosed court. The ground-plan of this type of ruin is shown in the diagrammatic sketch in figure 6.

This simple form of ruin is so common, and it enters so frequently into the structure of many of the larger and more complex buildings, that I have found it convenient to refer to it as the "unit



LARGE OPEN RUIN : FALLEN WALLS OVERGROWN WITH SAGE-BRUSH. AT THE EDGE OF A SHALLOW WASH ON THE YELLOWJACKET PLATEAU, COLORADO.

type." Houses of this type may have only three or four rooms along the back, with single rooms in the wings. Or there may be eight or ten rooms at the back with two or three in each wing. Frequently when there are several rooms along the back there are two or more *estufas* in the court.

The *house* in the most typical of these ruins is usually carefully constructed. The outer walls are from ten to fourteen inches thick, often laid up with two rows of stones dressed on the outer and inner faces, the space between being filled with rubble and

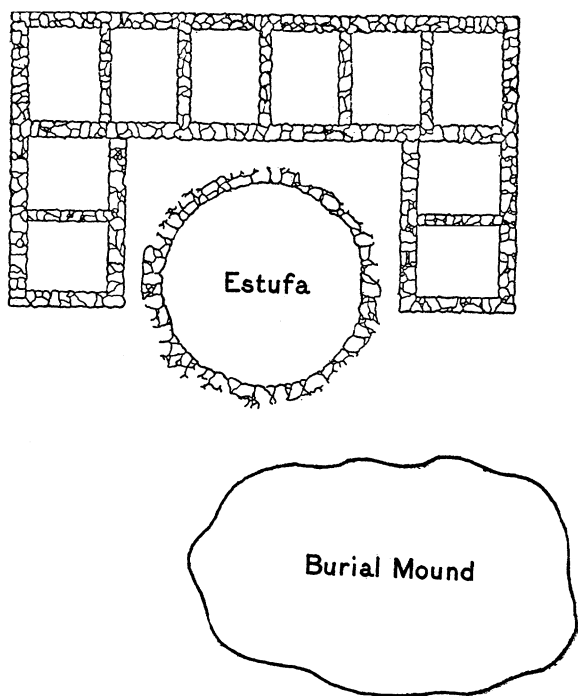


FIG. 6. — Diagram of ground-plan of small open ruins of the "unit type," showing the constant association of house, *estufa*, and burial mound.

adobe mortar. The partitions between the rooms are usually somewhat thinner than the outer walls and often consist of a single row of stones. Small doorways frequently lead from room to room. I have never seen openings in the back or sides, nor have I been able to determine the existence of doorways opening toward

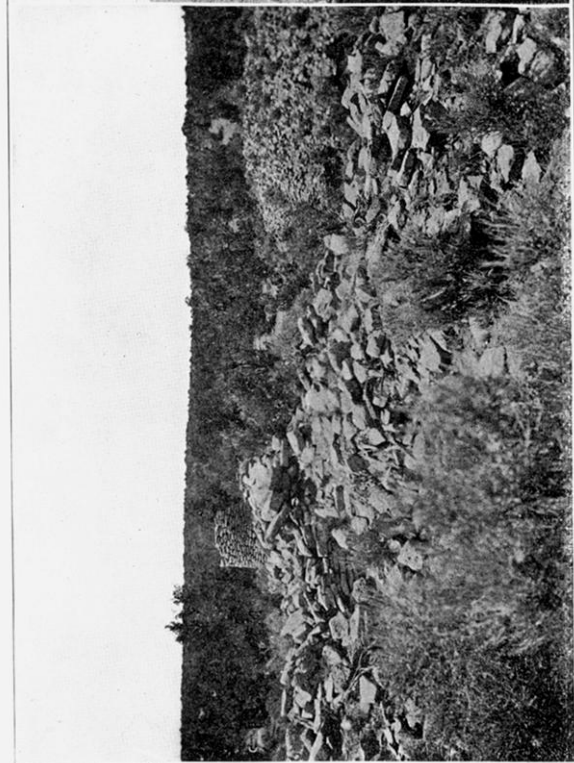
the estufa. The roof timbers, if such there were, have wholly disappeared from these typical ruins. In many cases, though the walls are largely fallen, the outlines of the buildings and rooms are readily made out, or are developed by throwing off a few of the outer fallen stones. In many instances, however, drifting sands have largely covered the ruins, or sage-brush and piñons have grown upon them, so that these and soil conceal most of the structural outlines.

The *estufa* is uniformly circular and is situated within or in front of the court formed by the wings of the house and which looks southward. It is usually sunk below the level of the ground surface and largely filled with earth and fallen stones from its walls, which I have never found rising above the general level when the ruins are built upon earth; they are then shallow circular pits, deepest at the center, and after rains may for a time contain water. Thus it is that they are commonly called reservoirs by the cattlemen and the Navahos. When the building is upon a level rock surface the estufas are built up like the rest of the chambers. But whenever the surface permits, even if it be rocky as at the edges of canyons, the estufas are apt to be situated in the lower and front part of the ruin. I have never excavated one of the estufas, so that I know nothing about their depth or internal structure.

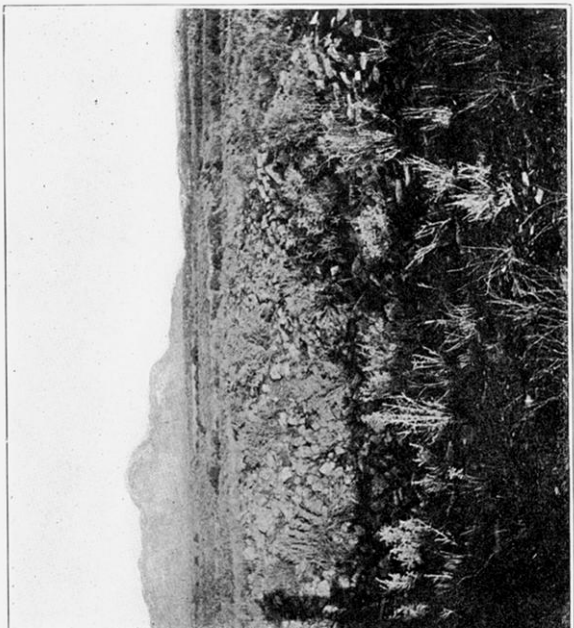
The *burial mounds* which are almost invariably associated with such ruins are, when the surface permits, uniformly south or southward of the house, sometimes close by, sometimes a few feet or yards away. They are sometimes very large, occupying much more ground space than the ruin itself. When not washed out they usually, though not always, rise a little above the general surface of the ground, are of irregular shape, and are more or less abundantly strewn with fragments of broken pottery. The soil on and about the burial mounds is commonly somewhat darker than the surrounding earth, and briars, sage-brush, and other shrubs are apt to flourish upon them.

My aims in this reconnoissance have not led me to make frequent excavations in these burial mounds, though in many instances the prospect of considerable booty in the way of pottery was excellent. I have, however, often followed closely upon the track of the





1. PORTION OF LARGE FALLEN RUIN WITH TOWER, ON JACKSON CANYON, WESTERN  
BRANCH OF MONTEZUMA CREEK, UTAH,



2. SMALL FALLEN RUIN, "UNIT TYPE," ON THE YELLOWJACKET  
PLATEAU. UTE MOUNTAIN IN THE DISTANCE.

professional pot-hunters and had occasion to note the large number of burials which may be discovered in a mound attached to a very small and inconspicuous ruin. Once on the side of a freshly formed arroyo on Montezuma Creek, I have seen a complete section of the burial mound, the dark earth of which filled a saucer-like artificial depression sunk at the middle portion about two feet below the general surface of the valley bottom. It does not fall within the scope of this paper to record many interesting facts about the forms of burial in these mounds so constantly associated with ruins of this type.

The pottery found in and upon these mounds may be plain gray undecorated, or corrugated, or variously painted, usually with black on a white surface. Red ware is occasionally found but is not common except in certain limited regions. The bones in these exposed burial mounds are sometimes crumbled, sometimes firm and well preserved.

In earlier days the seeker for hidden treasure or for merchant able relics was wont to pull down the walls of the ruins and to delve beneath the rooms. But since the significance and constancy of the burial mounds have become generally known, the fury of the pot-hunter has been largely diverted to them. It is from these burial mounds of the open valley and mesa ruins that a large part of the pottery is derived which is constantly poured into the bric-a-brac and curio market through ranchmen, traders, and professional vandals.

I am not aware that one of these ruins of the "unit type" has ever been completely excavated. Considerable interest would attach to such a work, which should include not only the dwelling rooms and the estufa but the whole area of the burial mound. While small ruins of this type are sometimes isolated, sometimes strung along the alluvial bottoms of the valleys, they are frequently grouped in villages and then are often placed within a few yards or rods of each other. But in the latter case the three components of the unit are strictly maintained, each dwelling having its estufa and its burial mound.

Ruins of this "unit type" are to be found over the entire ruin area of the San Juan watershed from the upper reaches of the Yel-

lowjacket and its tributaries to the southern limits of the Chaco drainage, and from the Compañero Canyon to Marsh Pass. But it is north of the San Juan, from the Mesa Verde to Comb Wash, that they are most abundant and form, in fact, the largely preponderant type of ruin. In situations favoring the use of boulders, as along the San Juan and La Plata, this "unit type" is also prevalent.

I am disposed to attach considerable significance to this type of small dwelling, with its uniform association of house, estufa, and burial mound, as the simplest expression of an early and primitive phase of the house-building culture. The character of these small ruins as types of residence was overlooked in the earlier surveys of this district, and the significance of the burial mound was not recognized. When receiving special mention the latter was looked upon simply as a rubbish heap, strewn with broken pottery. It is, in fact, often a rubbish heap as well as a burial mound.

Variants of this type of ruin are common. Thus, there may be a double row of rooms at the back with a single or double row in the wings. In such double rows the back row may have two stories. Or these structural units with either single or double rows of rooms may be placed end to end, often thus forming buildings of considerable length.

Sometimes the wings are prolonged, having several rooms enclosing a square or elongated court which contains the estufas. This is a noteworthy form at the Yellowjacket Spring ruin, and here a low wall was often thrown across the front from wing to wing, the estufas being within the court while the burial mound was in each instance outside and southward of the building.

In various ways these "type units" are frequently placed together, forming large buildings with irregular passageways here and there between them. In such cases it is not infrequently evident from different degrees of preservation and from differences in the character of the masonry that the buildings were made at successive periods.

Among the very unusual forms of isolated open ruins which may be considered as variants of this type I may mention a single straight row of rooms without wings, with estufa and burial mound south, which is on Montezuma Creek; also the placing of two

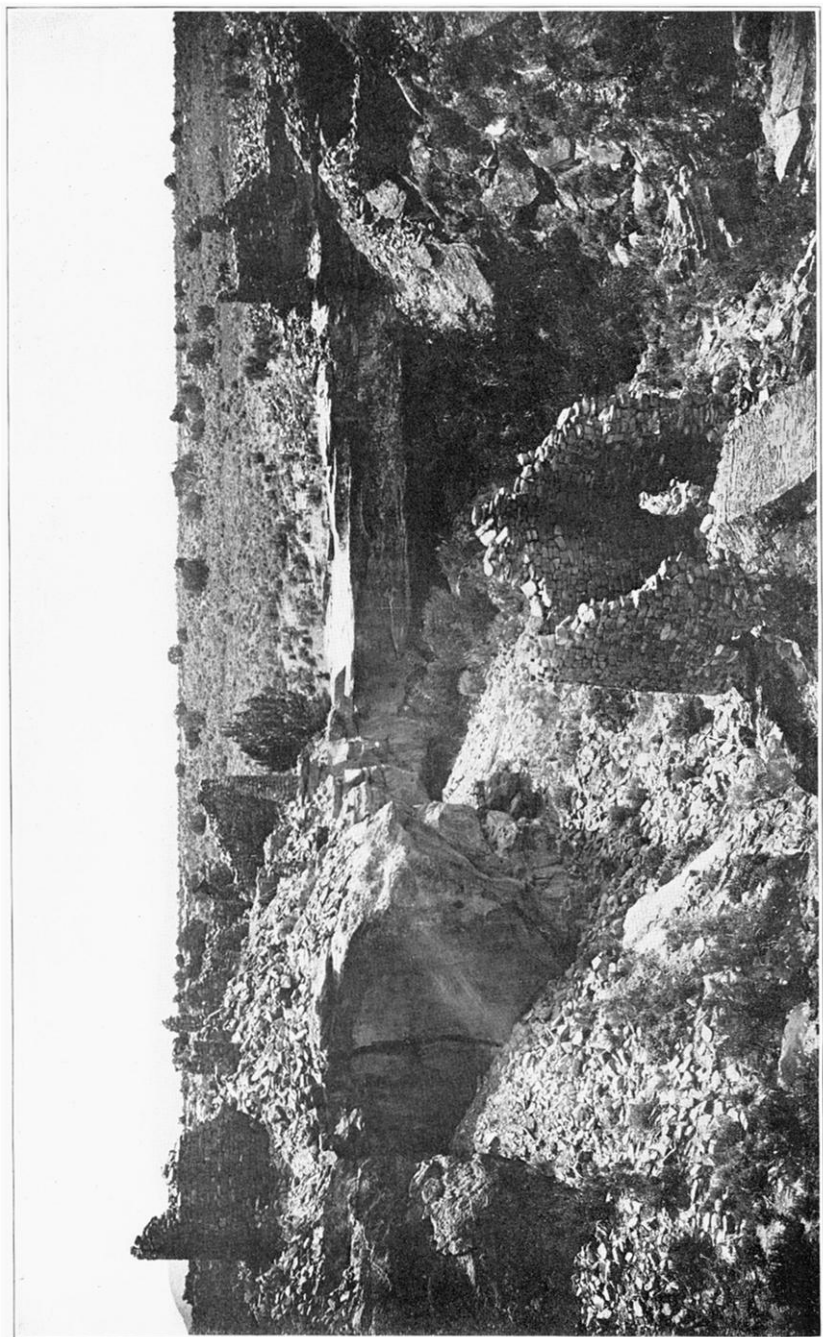


PHOTO BY CHAS. GOODMAN.

OPEN RUIN BUILT AROUND THE HEAD OF A CANYON—THE CANNONBALL, A TRIBUTARY TO THE YELLOWJACKET, COLORADO.



equal rows of rooms in the form of a V, in the southward angle of which is the estufa. This occurs on Comb Wash. In two instances on Montezuma Creek I have seen the estufa completely enclosed by a single row of rooms.

While this "type unit" is usually evident even in noteworthy variants where the ruins are built on a level with abundant space around them, this is by no means the case when the buildings stand on uneven ground or on a cramped surface, as upon an isolated rock or point, or when they are built upon the brinks of canyons or, as is frequently the case, around the heads of gulches. But even in such situations one usually finds suggestions of the type form or may find it fully carried out here and there in a complex ruin where a small surface permits it, while the remainder is adapted as best may be to the irregularities of the site.

## 2. OPEN RUINS ADAPTED TO SPECIAL SITES

The next best defined type of ruins of this class which stand in the open are those which are built around the heads of rock gulches or canyons. The shallow water-courses, often inconspicuous upon the tops of the larger plateaus, are apt to break suddenly into rocky gulches which join to form the great inland canyon feeders of the San Juan River.

The ruins which are built around the heads of such small canyons or gulches are especially numerous in the country north of the San Juan and between the valley of the Mancos and Montezuma Creek in Utah. They are always irregular in form, often composed of a series of isolated chambers or groups of these around the brink of the canyon, and not infrequently extending down the rocky slopes or ledges toward the bottom (plate XXII). The direct line of the stream is usually left clear. Not infrequently a rude stone dam is still to be seen across the shallow sag in the rocks above the ruins. Occasionally there is a shallow cave beneath an overhanging ledge at the head of the gulch in which is a spring or a water-pocket. In several ruins of considerable size built around the cliff edges at the head of a gulch, a rock wall about three or four feet high, often forming a zigzag, stands a few feet outside the line of the ruins, partially or completely fencing them in. The sketch of the ground-

plan of a ruin at the head of East Hawkberry (figure 7), shows the grouping of the ruins and the portions of the low wall at the rear of the houses. Burial mounds are often apparently absent in such ruins, but isolated burials were made beneath neighboring rocks and ledges. Examples of such groups are found at the head of Cannonball Canyon (plate xxii) of East Hawkberry and of Ruin Canyon, which are all tributaries of the Yellowjacket.

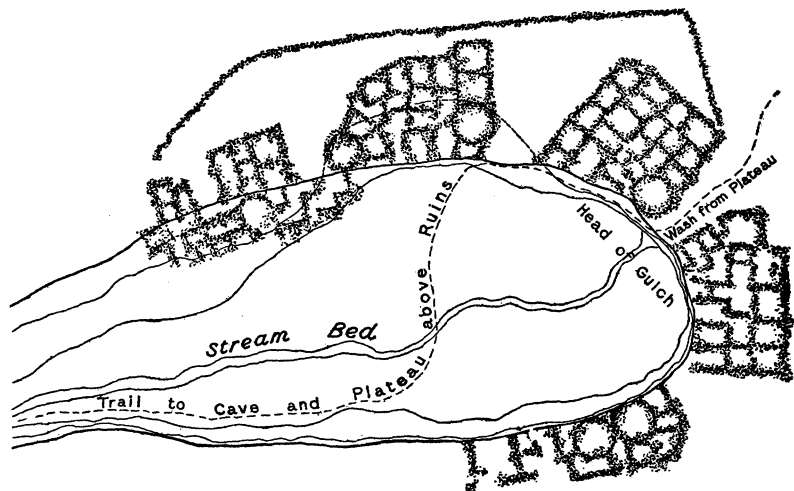
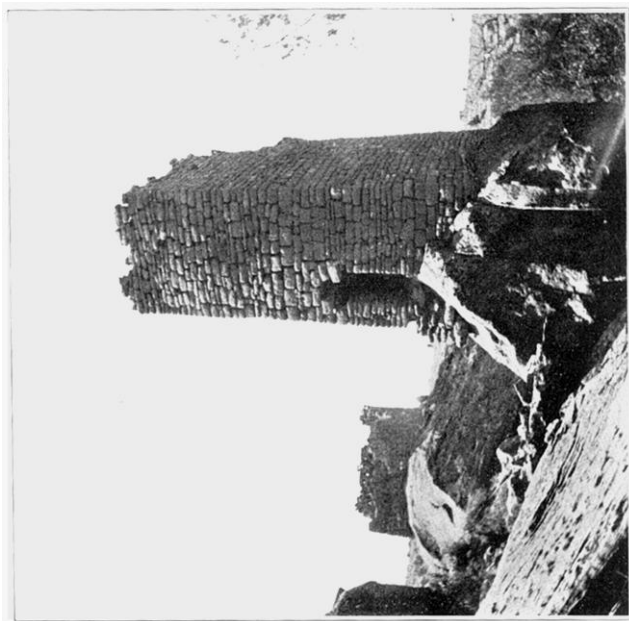


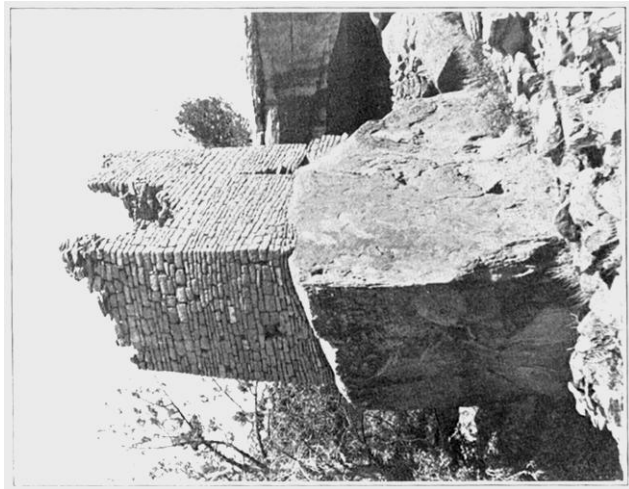
FIG. 7.—Ground-plan of a ruin adapted to the special site at the (East Hawkberry) head of Bridge Canyon, in the Yellowjacket group.

There are many widely scattered ruins of considerable size standing in the open and formed by an irregular mass of chambers from one to three stories high, with estufas scattered here and there among them. Such ruins usually occupy more or less commanding and often distinctly defensive sites, such as the tops of small isolated mesas, or flat, high, rocky points commanding the valley bottoms. There are several such ruins in the northern San Juan country west of the Mancos Valley which contain from forty to sixty rooms and a few which have one hundred to three hundred rooms.

One engaged in practical studies of the ruins of the Southwest is soon led to abandon any notion which he may have derived from the earlier and often conjectural data of the books as to their universally defensive nature. But, on the other hand, there are ruins



1. TOWER FORMING PART OF A GROUP OF RUINS ABOUT THE HEAD OF RUIN CANYON, IN THE YELLOWJACKET REGION, COLORADO.



2. SMALL TOWER-LIKE STRUCTURE ON AN ISOLATED ROCK AT THE HEAD OF RUIN CANYON, IN THE YELLOWJACKET GROUP, COLORADO.

here and there whose situation and construction leave no doubt as to the defensive motive strictly carried out in many details, so that the word fortress, or fortified rock or mesa, may now and then appropriately be used.

### 3. TOWERS AND OTHER ISOLATED STRUCTURES

Towers of various forms and heights occasionally form a part of composite ruins of various types (plate XXIII ; XXIV, 1). The most common examples are in the Yellowjacket group of ruins. Isolated towers and small single-room structures, often commanding wide outlooks, are occasionally found throughout the San Juan district, but are especially common north of the river (plate XXIV, 2, 3).

Small single buildings ; large and small low-walled stone enclosures ; square or oblong box-like structures from one to two feet across made of thin stone slabs, often apparently empty or sometimes containing a little charcoal, are not uncommon both north and south of the river. Here and there are rows and clusters of thick slabs of stone set upon end (plate XXIV, 4) without other apparent associated structures.

One occasionally finds large, shallow, circular pits having the general appearance of estufas, but much larger and usually standing apart, sometimes several hundred feet from other ruins. They are often sixty feet or more in diameter, and while now largely filled were evidently stone-walled chambers beneath the surface of the ground. Their nature is wholly unknown to me.

### 4. LARGE COMMUNAL PUEBLOS

The largest of the ruins in the San Juan country are in the form of great pueblos or communal dwellings formed of a congeries of rooms, often several stories high, with either one or more courts which usually open southward. These stand in the open, either in the valleys (plate XXV, 1) or on the tops of the mesas (plate XXVI), and resemble in many ways the great inhabited pueblos like that of Acoma and those of the Hopi group. Such are the ruins in the upper Chaco Valley, the great ruin near the modern village of Aztec in New Mexico, and the so-called "Aztec Spring Ruin" at the foot of the Sierra El Late in Montezuma Valley in southwestern Colorado.



Of similar character, though somewhat smaller, are the ruin near the banks of the San Juan River a few miles below Bloomfield in New Mexico, and several in Utah lying far apart on the high mesas north of the San Juan and west of the Mancos Valley.

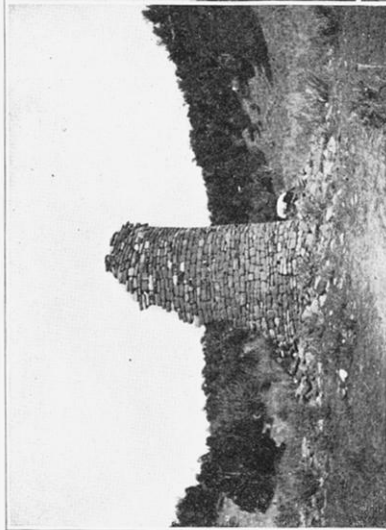
Near some of the large pueblos burial mounds of considerable size have been found. In other instances, however, notably in the Chaco group, the situation of the mass of the burials is still unknown.

#### OPEN RUINS SHOWING INFERIOR CONSTRUCTION

One who examines critically the ruins in various parts of this San Juan district can hardly fail to be impressed with the fact that in many places there are distinct grades of excellence in the construction of the buildings as well as marked differences in the type. On the one hand there are ruins of buildings constructed with much care and skill. These when small and in open situations usually conform more or less closely to the "unit type" or present some obvious variant of this; or when they are large or built in situations requiring special adaptation to locality, they also display skill in construction and painstaking attention to form, stability, alignment, and minor details of the masonry. Near such ruins, when the nature of the site permits, the burial mounds are usually present and often large.

On the other hand there are many ruins widely scattered over this district, but most numerous in the Yellowjacket and Montezuma Creek groups, which though often large and now forming massive piles of stone, are crude in construction. The grouping of rooms is irregular, the alignment of the walls faulty (plate xxv, 2), the masonry unstable. The burial mounds are absent or irregularly placed, some at least of the burials having been made singly under the edges of fallen rocks or at the foot of ledges near the ruins. Pottery fragments, which are so common about the old sites, are few and irregularly scattered.

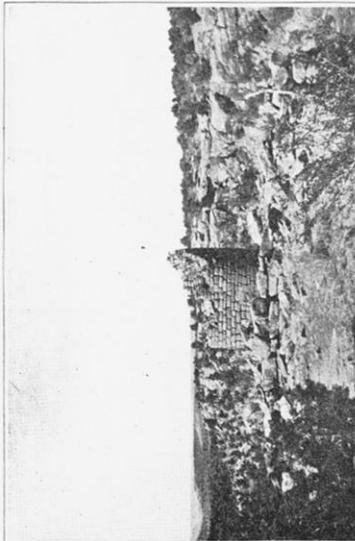
The impression which one gains from these ruins is of hasty and careless construction and of relatively brief occupancy. It is in this class of structures that one most often finds evidences of the defensive motive in situation and construction. Weathered timbers are often present in such ruins, although they stand in exposed



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1. Round tower with remains of small rooms at its base; in Hovenweep valley, Yellowjacket group, Colorado.

2. Small isolated tower at the mouth of Sand Canyon. The outlook is across McElmo Canyon to Ute Mountain, Colorado. This tower commands the access to several small cliff houses in Sand Canyon.

3. Remains of round tower, with outlook down Hovenweep valley; Yellowjacket group, Colorado.

4. Upright slabs of rock at foot of cliff in Montezuma Creek valley, Utah.

situations, and they are rarely much covered by soil; whereas timbers are rarely present in the older types of ruins except when these are built in protected places such as caves and ledges, or, as in the case of many of the large pueblos, are deeply covered with the wreckage of the fallen upper walls and with soil and drifted sand. The more roughly built ruins are frequently found in the vicinity of the more typical and apparently older structures, and in several such instances it is probable, from the disparity between the amount of building stone remaining and the size of the site, that stones from the older have been used in the construction of the later buildings.

It is of course not easy to judge of the relative age of such ruins from the evidences of weathering, since in many of the valley ruins exposed to the almost constant action of drifting sand the marks of weathering are much more rapidly acquired than is the case upon the high mesas where the sand drift is but slight.

## II. RUINS IN PROTECTED SITUATIONS IN CLIFFS

### *a.* CLIFF DWELLINGS

The ruins built in the shallow recesses weathered out of the sand rock in the sides of the canyon walls, as well as those which stand upon narrow ledges overhung and in part protected by the cliffs above, vary in form, size, and material with the differences in site. There are countless intermediate forms between the long, high shelves upon whose brinks shallow stone cabins stand alone or in single rows (plate XXVII, 1) to the shallow recesses at the level of the valley bottom (plate XXVII, 2) in which time and flood and wind drift have dealt less kindly with the old habitations than with those upon the higher levels. There is almost endless variation from the great caverns of the Mesa Verde (plate XXVIII) with their large and still imposing buildings or great masses of fallen walls to the tiny recesses (plate XXIX, 1) with scarce foothold for a pair of rooms.

The belief was developed early in the study of these ruins, and has since been widely entertained, that the builders of houses in natural or artificial recesses or caves in the cliffs represented an earlier and a different phase of culture from that which inspired the buildings, large and small, which stand in the open and which are

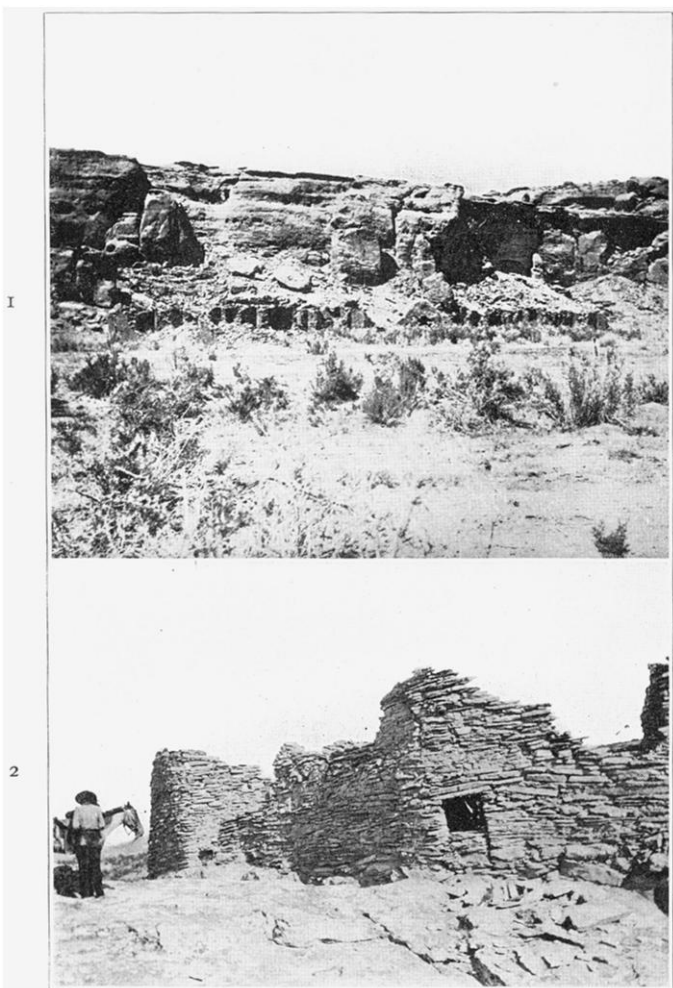
necessarily of a somewhat different structural type. But this notion is not justified by the accumulating evidence of the essential identity of the housebuilders' culture, variation in type of structure being clearly accounted for by differences in local environment and by such conditions of change as might readily occur within a very limited ethnical period.

It was obviously important in the choice of a building site in a cliff recess that the slope of the bottom should not be so great as to render insecure the foundations of the buildings, though in many instances this difficulty has been most skilfully overcome. The overhang of the cliff must be such that the water, running in torrents as it often does from the bare rock surfaces above, should fall clear of the building site. The roof of the recess must be solid and not, as is often the case, weathering off in huge blocks or in shaly flakes. The accessibility of the site seems not to have so much concerned the builders, for though in most instances there are simple and natural modes of access even to those cliff ruins which it appears at first impossible to reach, in the last resort they frequently pecked into the rock those foot and hand holes up the steepest slopes which are still not wholly obliterated and still useful. Finally, it appears to have been almost indispensable that the chosen site should have a southward or at least a sunny exposure.

When all these factors are considered, I think it is safe to say that it will be evident to one who travels widely in the San Juan district, searching critically the cliffs and the walls of the canyons and gorges, that a large proportion of the natural recesses which are accessible and suitable in depth, in the slope of the bottom, in the character of the overhanging walls, and in exposure, are now, or give evidence of having been at some time, occupied by buildings. The form, number, and distribution of the cliff houses, then, in any region is strictly dependent on its natural features.

When, therefore, in a study of the accompanying map one discovers certain localities in which cliff houses preponderate and others in which ruins of other types prevail, justifiable inference does not point toward different stages of culture or periods of occupancy or stress of circumstance. It simply indicates that in one case the weathering of the cliffs has led to the formation of recesses adapted





1. RUIN OF ONE OF THE SMALLER PUEBLOS (WEJE-GE) OF THE CHACO GROUP, NEW MEXICO.
2. RUIN SHOWING INFERIOR TYPE OF MASONRY: ON CARRISO CREEK, A FEW MILES ABOVE CHIN-LEE VALLEY, ARIZONA.

for building sites, while in the others suitable sites have not been formed — either because the dip of the strata, the character of the rock, the nature and rapidity of erosion, etc., have not favored the formation of rock shelters in the cliffs; or, because no cliffs exist.

The size, form, and excellence of the buildings, however, are subject to an extreme variation not accounted for by the nature of the site. Thus there are many large cave-like recesses with excellent exposure, level bottom, wide overhang, and convenient water supply, in which the ruins are small and inconspicuous. There are other caverns, however, presenting similar favorable conditions, in which all of the available space has been utilized for building with a high degree of ingenuity and skill.

Thus the largest cliff dwellings of the Mesa Verde (plate xxviii) afford the most striking and picturesque examples of this form of communal dwelling, equaled by but few others in the entire country. On the other hand, in Grand Gulch, on the slopes of the Butler fault, and along the Chin-lee, equally large and apparently equally favorable recesses contain but few and simple dwellings.

I have entered upon these general considerations here because it is, I think, desirable in a study of the accompanying map to realize how significant an influence the topography and formation of a given locality may have upon the character of the dwelling places.

#### BURIAL CAVES

There are in some parts of the San Juan district numerous cliff recesses or shallow caves at the level of the valley bottom which apparently have never been building sites but have been used for burial. Such caves are most common along the upper tributaries of Cottonwood Creek, on Butler Wash, and on the lower Chin-lee and its tributaries. Sometimes the number of burials in these caves was very large. In one case (plate xxix, 2) eighty bodies have been discovered in a single cave.

#### b. CAVE DWELLINGS

The most typical and noteworthy examples of cave dwellings or cavate lodges in the southwestern United States are those in the soft volcanic formation in the narrow canyons in the eastern slopes of the Valles of the great Cochiti Plateau in New Mexico and those

in the sandstone ledges along the Rio Verde in Arizona. There are, however, a few examples in the San Juan district — a small group on the lower Mancos, and another, much weathered, on the San Juan itself, a few miles above the mouth of the Mancos (plate xxx, 1).

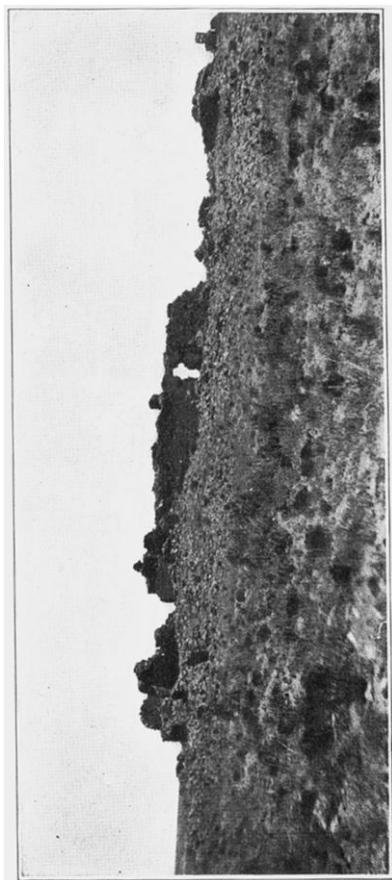
#### WATER SUPPLY

The general subject of the water supply of the early inhabitants of this arid region may perhaps profitably be considered here. It should be remembered, first, that the personal requirements in this respect of these people, as of their successors in this desert country, should not be judged by the standard which a more advanced culture and a different climate impose; second, that few arid regions are actually as devoid of water as they seem to be, and that a long and close familiarity with a dry country often reveals fairly abundant hidden sources of moderate supply.

It is the failure to take account of these important considerations which has so often led to the belief that in the time of these early residents the climate must have differed essentially from the present with a much more abundant rainfall. But while this is a natural first impression it is not sustained by a careful and extended study of the region and the ruins.

If, as has often been the case, one cherishes the notion that the defensive motive was dominant in the selection of sites and in the construction of buildings, and further, that these dwellings are to be regarded as largely fortresses which were in a state of frequent and prolonged beleaguerment, the necessity in certain instances of more numerous and more abundant water sources might be conceded. But in the majority of instances the defensive character of the sites and buildings does not seem to me to be at all obvious nor the evidence of frequent sieges at all clear.

In fact, the greater proportion of the larger pueblos (those on the Chaco, the San Juan, the Animas, and the Chin-lee), as well as many of the larger valley villages (those, for example, on the San Juan, La Plata, the Mancos, and the Montezuma), are close beside living streams or stream-beds which bear abundant currents just beneath the surface. Furthermore, many of the large recesses in the walls of canyons and gulches in which the cliff dwellings are



PUEBLO ALTO RUIN: ONE OF THE CHACO GROUP, ON THE MESA NORTH OF THE CANYON—NEW MEXICO.

built furnish a constant trickle of water from the rock strata in their depths—to whose action, indeed, in many instances the weathering of the rocks into cave-like recesses has apparently being largely due.

It should also be remembered that, dry as many of the great sand bottomed washes and canyons may appear, there is along many of them a steady deep flow of ground water which collects here and there, where the rock bottom rises, in great underground pockets beneath the stream-beds or valley bottoms and comes out at times upon the surface.

The ancient resident of this district doubtless knew as well as his successor, the Navaho, knows, exactly where very little digging in an apparently absolutely dry, sandy stream-bed would furnish an abundant and unfailing supply of water. It is illuminating in this connection to travel with a Navaho Indian over the desert country and see how often a little scraping in the dry sand which has blown across the foot of a rock ledge or has gathered in a stream-bed along which you may have been riding for miles, desperately athirst, will reveal a trickle of water running away just beneath the surface. Many of the old springs near the ruins, which constant use would keep open, are now no doubt covered with sand drift. The more familiar one becomes with this country the less keen is his surprise at the occurrence of a little water in what seem the most unlikely situations. This is a land of vast erosion, many thousand feet of sedimentary strata have been washed away over great areas leaving the edges of the remaining portions widely exposed, and one is quite as likely to find a spring far up in the glare on the face of a great cliff or upon the top of a towering butte or mesa as upon the lower levels.

Nor need one assume that for an essentially agricultural people, as these old inhabitants of the San Juan district were, a more abundant water supply than now exists was necessary. The crops which the modern Indian secures in some hot, sun-baked sag in the long slopes which lead down to the dry stream-beds, and the fruit trees which flourish upon the glaring sand-dunes, indicate the presence of moisture in many places not too far beneath the parched surfaces to be reached by the rootlets of the meager crop.



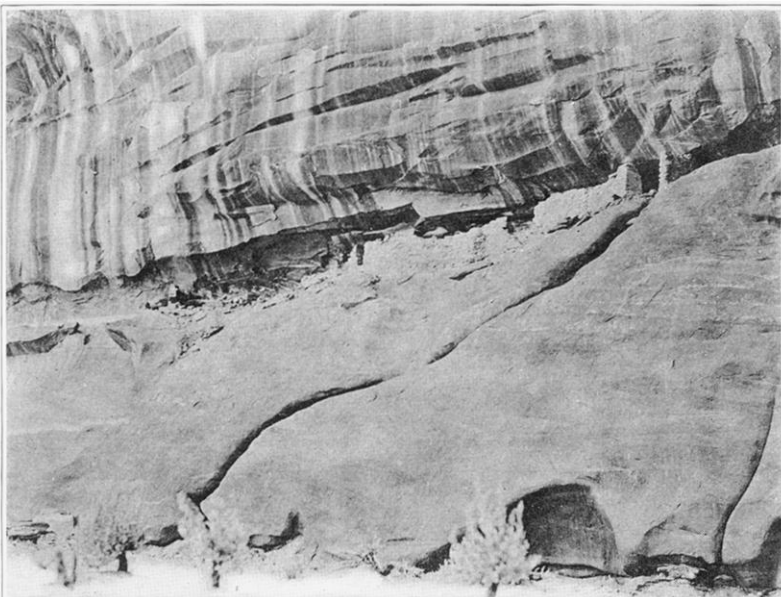
I would not convey the impression that the desert regions of the San Juan are well watered. One who journeys here even under the most experienced guidance has too many memories of long deprivation to be easily led into such a belief. But there are in fact many more sources of moderate water supply in all the regions containing many prehistoric ruins than from the general aspect of the country would seem possible.

On the other hand, that water was not abundant is evident from the many instances, to be everywhere seen, in which, by the construction of small reservoirs and ditches, by the damming of shallow sags on exposed rock surfaces, by the utilization of natural and the construction of artificial water pockets, the collection of rain-water was frequently resorted to.

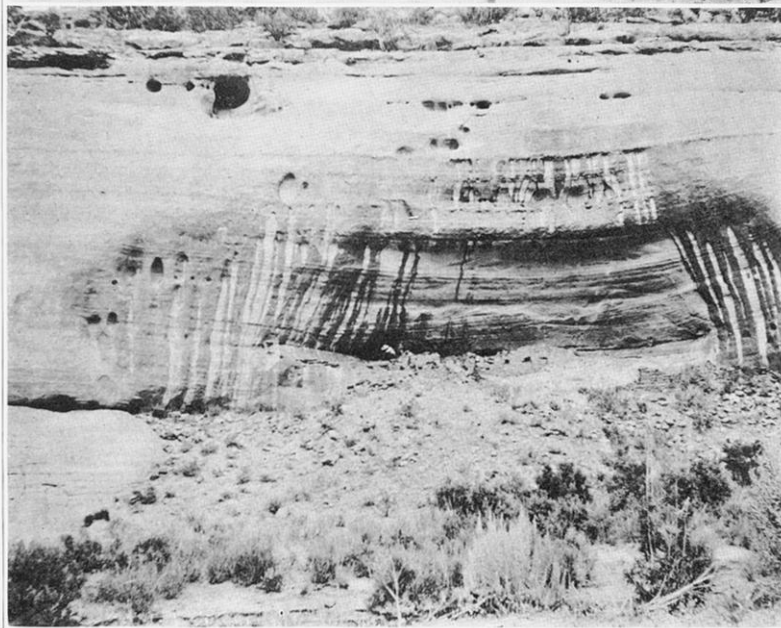
But after all there are many groups of dwellings of considerable size and many more isolated ruins which appear to be far from any source of water supply, and here the probability of transportation and storage in large jars so frequently found in and about ruins must be admitted.

I think, finally, that the impression and the fact of extreme dryness in many of the valley bottoms which were once populous and devoted to agriculture is due to the widespread formation of great arroyos which have been developed in the alluvial bottoms in recent times, in many instances since the advent of the white man with his herds of cattle and sheep. The close cropping and the trampling of the grass and the formation of deep hoof-cut trails along the sloping valley bottoms have wrought a great change in a large proportion of the valleys of the Southwest. The water from heavy showers and melting snows soon deepens and widens a cattle trail or starts an independent channel in the light alluvium which has lost its protective covering of grass and grass roots. Very soon a great winding channel has been cut in the soil, which deepens and widens with every flood, so that today in countless instances along the erstwhile level grass-clad bottoms, over whose surfaces large volumes of storm-water once ran off harmlessly, are those ragged chasms called arroyos, which often reach to the rock bottom of the valley and from whose sides huge masses of earth crack and fall to be swept along and away by the next flood. Thus an arable

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1. CLIFF HOUSES ON A SHELF IN THE FACE OF THE WALL OF A SMALL WESTERN TRIBUTARY TO THE CHIN-LEE COMING FROM ZILH-LE-JINI MESA, ARIZONA.
2. RUIN IN A SHALLOW RECESS AT THE BASE OF A CLIFF, MONTEZUMA CREEK, UTAH.

valley which was formerly irrigated by its rains and floods has now become a ragged chasm with a fringe of crumbling and rapidly disappearing soil along its sides.

There is, indeed, evidence of the formation of great arroyos and devastation by flood which antedate the coming of the white man and of that veritable blight upon the agricultural interests of the Southwest—the sheep-herder with his flocks. But the appalling devastation in many valleys by the rapidly forming arroyos to which I refer is of recent date.

This brief consideration of recently formed arroyos thus seems to me pertinent in an estimate of the water supply of the prehistoric people, because the regular melting of the snow in many regions, or a single early seasonal rainfall which would formerly have abundantly sufficed for the deep irrigation of favorable valleys for the entire season, now rushes off through the arroyo, working such havoc as may be, and leaving such portions of the alluvium as are still spared largely unwet or subject to direct and speedy seepage into the new open drainage channel.

#### PICTOGRAPHS

The pictographs of the San Juan district are either painted on the rocks, usually in white or red, or they are pecked or scratched upon the surfaces. The largest single group is on the cliffs facing the San Juan River at the foot of Butler Wash (plate xxxi). There are many painted as well as carven glyphs in Grand Gulch (plates xxxiii, xxxiv). Others are widely distributed usually in the immediate vicinity of ruins or ruin groups, or on the walls of recesses or caves in which the buildings are constructed, less frequently upon the walls of the buildings themselves. Some of the pictographs will be mentioned with photographic reproduction in connection with the ruins of special regions, but my study of them has not been sufficiently extensive to justify any further general observations upon them here.

#### THE GROUPS OF RUINS IN THE SAN JUAN WATERSHED

A glance at the relief map (plate xvii) shows marked differences between the regions north and south of the San Juan, both in the

topography of the country and, corresponding to this, in the number and character of the ruins, as seen upon the larger map (plate xvi).

The northern tributaries to the San Juan rise largely in lofty uplands or in high mountains. Many of them run for a considerable part of their course through valleys, gorges, or canyons, in whose walls various forms of such caves, recesses, and sheltered benches have been formed as may be adapted with more or less skill and labor to the construction of houses. Many of these valleys have wide or narrow alluvial bottoms which, though apparently dry, are yet in places sufficiently moistened by underground currents and lateral seepage for such primitive agriculture as sufficed for the simple needs of a considerable population.

A large part of the drainage area south of the San Juan is of an entirely different character, save for a limited region bordering the low mountain range which crosses the country from north to south. The three great tributaries to the San Juan from the south — the Largo, the Chaco, and the Chin-lee — rise along the crests of high, arid mesas and depend for their water largely on the melting snows or the seasonal showers, during which there is often a sudden large rainfall. It is a region of high, bare mesas and broad, rugged, basin-like valleys through which wind the mostly dry stream-beds. Thus it is that the southern San Juan district presents in relatively few places the conditions which were adapted to the requirements of the agricultural, house-building aborigines.

It is noteworthy, however, that in the high mountain country to the northeast where rise the San Juan and its perennial tributaries, as well as in the lower slopes of these mountains, although beset with many fertile valleys, there are very few ruins. East of the Animas valley ruins are almost wholly absent.

#### RUINS ON SAN JUAN RIVER

The ruins in the San Juan Valley are, for the greater part, small and scattered irregularly upon the great gravel benches which, in many places, stretch for miles along the valley a few feet above the river bottom. They are mostly boulder ruins, frequently sand-covered, whose ground-plan is not easily made out today. Occasionally, however, where the sandstone ledges approach the river,

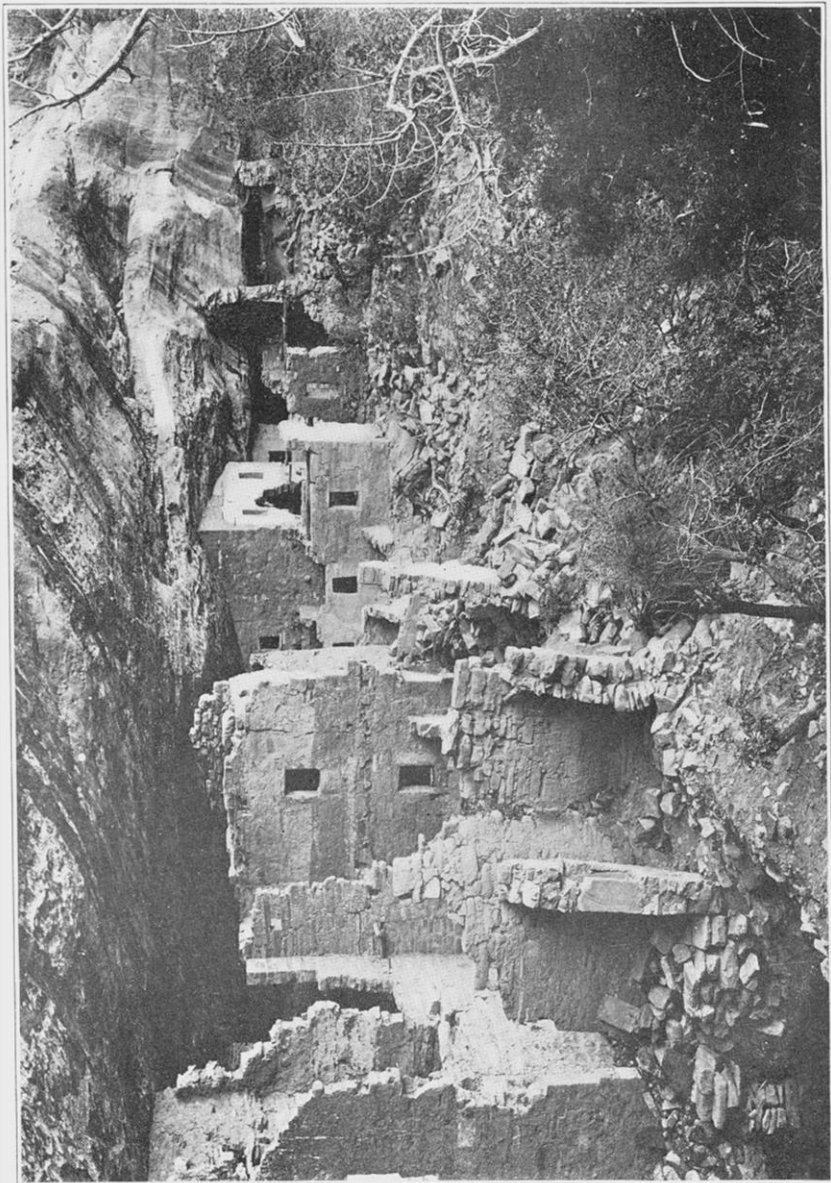


PHOTO BY ALFRED WETHERILL.

PORTION OF ONE OF THE GREAT CLIFF PUEBLOS OF MESA VERDE — THE "SPRUCE-TREE HOUSE," COLORADO.



dressed stone has been used in building. A few ruins, also of dressed stone, are situated on the alluvial bottom below the level of the gravel benches.

With the exception of two small sites on a high mesa top at its junction with Pine River, I have found no ruins on the San Juan above Bloomfield. Just below this village are the first of the small boulder sites which, as indicated on the map, are situated along the river, mostly on the north side, as far down as the mouth of Comb Wash.

It is not necessary for the purposes of this paper to enter upon details regarding the numerous small ruins scattered irregularly along the San Juan Valley (see the map, plate xvi). Although small, most of those whose outlines can be made out seem to be of the "unit type." The burial mounds, though in many places much washed, are typically placed and are often strewn with broken pottery. Many of the mounds, especially between the mouth of the McElmo and Bluff City, have been dug and considerable pottery has been found.

There are, however, as one descends the river, several noteworthy objects.

The only large ruin in the entire San Juan Valley stands upon a low bench at the edge of the alluvial bottom a few miles below Bloomfield. This is called locally "Solomon's Ruin" after the name of the owner of the land on which it is situated.<sup>1</sup> It is built largely of dressed stone, the walls in some places resting upon a foundation of small boulders. It was several stories in height, and contained many rooms, but is now so largely fallen and covered with sand and earth that the plan can be only partially made out. This ruin measures about five hundred feet along the back and is of the communal pueblo type like the ruin at Aztec on the Animas and the great pueblos of the Chaco.

Recently considerable random digging has been done in the search for pottery, and water from an irrigating ditch has been turned

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<sup>1</sup> This ruin, as well as others along the San Juan, is mentioned by Newberry in his report of the Exploring Expedition from Santa Fé to the junction of the Grand and Green Rivers in 1859. The report of the expedition, which was in command of Captain Macomb, was published in 1876, from the Engineer Department, U. S. A.

into the ruin, undermining it in several places. Thus the existence of several rooms has been revealed whose walls beneath the covering of fallen stones and soil appear from without to be largely intact, the well preserved timbers above them being still in place. In spite of the vandalism which has had its way with this ruin, there appears to be still promise of interesting results should a proper investigation of what remains be speedily undertaken.

About ten miles above the mouth of Mancos River, on the north side of the San Juan, is a small group of cavate dwellings formed in a stratum of Cretaceous shale exposed here in a low bluff close beside the river bottom (plate xxx, 1). On the top of the bluff, above the now shallow and much weathered remnants of the caves, are ruins of isolated buildings of considerable size. This interesting group of ruins was examined in 1875 by Holmes, who later described and illustrated it.<sup>1</sup> A few similar but smaller cavate lodges on the lower Mancos are described by Holmes<sup>2</sup> and have also been visited by the writer.

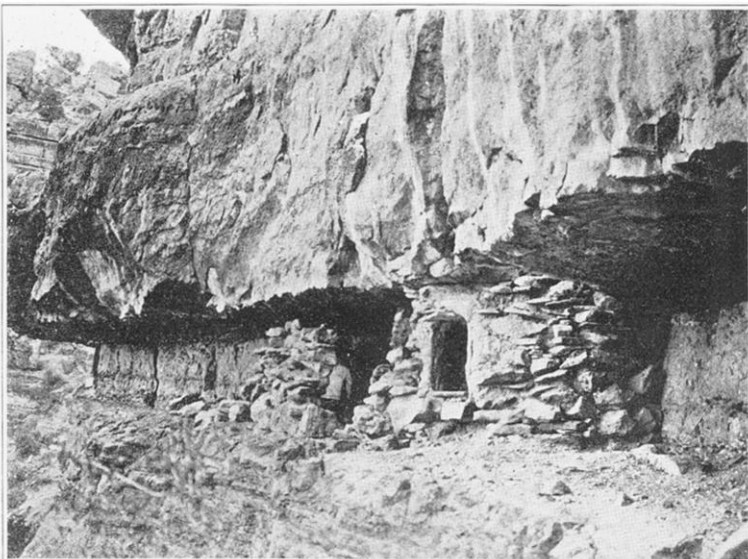
While these cavate dwellings of the San Juan and the lower Mancos are in fact partly dug out of the soft rock and are thus in a measure typical of this class of dwelling, they are not especially different in character from the other small cliff houses in this region save that the front of the shallow and in part at least artificial cave, where the front is not weathered or washed away, is walled up. The typical cavate dwellings, on the other hand, of the Verde and the Cochiti region are almost wholly dug out of the soft rock, the wall in front being largely formed of the natural rock while the cave was often connected with an outside building in front. This difference is not emphasized here because it is of fundamental importance, since both phases of dwellings are adaptations to the immediate surroundings of these people. It is, in fact, highly interesting to note how these early folk have utilized these very small and quite local outcrops of soft shale (plate xxx, 2) in favorable situations to secure, with slight expenditure of labor, small dwellings of a peculiar constructional type.

But these examples of this form of dwelling are so small or so largely weathered away that one who should be tempted to make the

<sup>1</sup> *Tenth Annual Report of the (Hayden) U. S. Geological Survey*, 1878, p. 388.

<sup>2</sup> Loc. cit., p. 390.

I



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1. SMALL CLIFF HOUSE IN TO-WAN-AH-A-CHE CANYON, IN THE MARSH PASS DISTRICT, ARIZONA.
2. BURIAL CAVE ON BUTLER WASH, UTAH.

long journey to the San Juan and lower Mancos for the sake of a study of cavate lodges would risk disappointment, especially in view of the more extensive, varied, and typical groups in the Verde valley which may be reached from Flagstaff or from Prescott, Arizona, or those in the valley of the Rio Grande upon the eastern slope of the Valles now readily accessible from Española in New Mexico.

For several miles down the San Juan below the mouth of the Mancos only the small valley sites are to be found. Just below the mouth of Montezuma Creek, on the north side of the river, is a group of structures of unusual form described by Jackson.<sup>1</sup> On the south side of the river, a short distance above Bluff City, is a large cave containing a group of small houses. This was called Echo Cave by Jackson and was also described and figured by him.<sup>2</sup>

At the mouth of Butler Wash, which enters the San Juan through a narrow gorge, is a line of sheer, smooth-faced, sandstone cliffs along whose base considerable rock talus has gathered. At the top of this talus for several hundred yards on either side of the mouth of the Butler the faces of the cliffs are rich in ancient graven pictographs. Some of these are cut deep in the rock; some are shallow. In places they are very closely crowded; in others they are superimposed. The figures are of many forms (plate xxxi), some representing men, mountain-sheep, birds, trees, and serpents, together with a host of the conventional figures found in many parts of this watershed, such as rain-clouds, geometrical forms, etc. These petroglyphs it seems to me wiser to record in the accompanying photographic reproductions than in verbal descriptions. The faces of the cliffs are in places weathering very fast and it is important that squeezes or more detailed photographs should be made than was possible in my hurried reconnoissance.<sup>3</sup> There are a few small ruins in the valley bottom near these pictured rocks.

<sup>1</sup>*Tenth Annual Report of the (Hayden) U. S. Geological Survey*, 1878, p. 416.

<sup>2</sup>Loc. cit., p. 418.

<sup>3</sup>I have here as in many other places refrained from making paper "squeezes" of the pictographs, because the rock surface is usually considerably weathered and the cast on removal is apt to bring with it such an amount of disintegrated material as perceptibly to damage the edges of the glyphs. It is to be hoped that such impressions may soon be secured in systematic fashion by a more adequately trained worker.

Just below the mouth of Comb Wash, where are a few small ruins, the lower canyon of the San Juan begins, and from here to its junction with the Colorado, though this stretch I have not traversed, I have not been able to learn of any ruins, nor is the character of the country such as would make their existence probable.

#### RUINS OF THE NORTHERN TRIBUTARIES OF THE SAN JUAN

The entire region drained by the Piedra and Pine rivers appears to be devoid of ruins.

#### RUINS ON THE ANIMAS

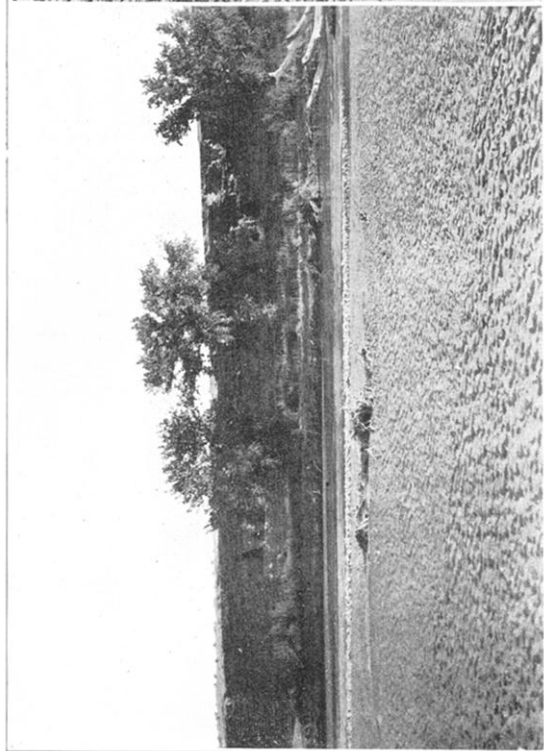
The first of the northern San Juan tributaries along which ruins are found is the Animas, a river of considerable size heading in the high mountains of the Needle and San Miguel ranges. There are many stretches of arable bottom land here and there along the stream, especially in its lower reaches. A few miles above the mouth of the river, near the modern hamlet of Buena Vista, is a little cluster of small ruins in the valley bottom.

Farther up, near the village of Aztec, on a low gravel bench west of the river, lies the group of large pueblos called the "Aztec Ruin." The largest and best preserved of these was over three hundred and fifty feet long at the back and several stories in height with a court facing eastward. Near by are several large stone and earth heaps, indicating older sites. A large mound near the edge of the low bench bordering the valley bottom gives superficial evidence of many burials. It is said that in early days this ruin was used as a stone quarry by neighboring settlers. It is now on private property, and the owner, Mr Kountz, wisely appreciative of the importance of systematic study of these relics of the elder folk, has guarded them from the onslaught of the vandals, so that here one of the most promising of the great old pueblos lies waiting for the trained and authorized explorer. A small opening has been made in one corner of the ruin, through which several rooms may be entered in succession. These are practically intact, with the ceiling timbers in place and well preserved. The exact size and form of this ruin are not evident in its present condition.<sup>1</sup> Within

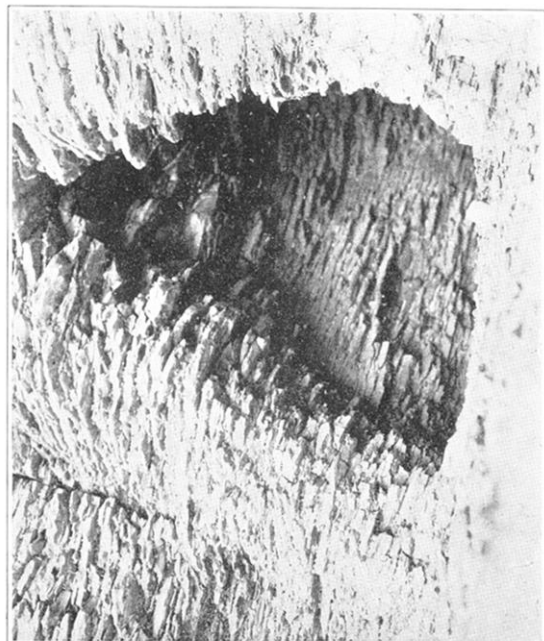
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<sup>1</sup> It was visited by Newberry in 1859, and is briefly described in his report of the *Expedition to the Junction of the Grand and Green Rivers*, published in 1876, p. 80.





1. General view.



CAVATE DWELLINGS ON SAN JUAN RIVER.

2. The weathered remnant of one of the cavate dwellings, showing the soft shale in which the shallow shelters were dug.

sight of this ruin, in the valley bottom, several small sites may be located.

Above this large group of ruins only a few small scattered sites are to be found in the valley of the Animas. Three or four are near the town of Durango.

#### RUINS IN LA PLATA VALLEY

In the valley of the La Plata, a small stream rising in the mountains of the same name and entering the San Juan a few miles below the mouth of the Animas, there are many small mostly boulder sites. These are widely scattered in the lower reaches of the valley, where arable bottom lands exist, and are most abundant near and below the present village of La Plata, about twenty miles above the mouth of the river. They are mostly on the west side of the stream, near the present Durango-Farmington road.

The boulders are as a rule small, and a considerable amount of adobe mortar was evidently used in the masonry. Many of these houses are now represented by low, scattered heaps of stones, but the "unit type" is often evident. A large number of the burial mounds of these ruins in La Plata Valley have been dug into by local pot-hunters.

There is one larger ruin on a low bench on the east side of the stream, opposite La Plata village, which is described and figured by Holmes.<sup>1</sup> There are a few small boulder sites scattered along the valley bottom up as far as Dale's—the ranch of an early settler in this valley, a short distance below the New Mexico line, which has become a well known stopping place for travelers in this region.

On a point of the gravel bench overlooking the La Plata from the west, a short distance below Dale's, and scattered along the same bench for two or three miles northeast of Dale's, are small boulder sites. Three little cliff houses are to be found near the mouth of a small canyon opening into La Plata Valley a short distance west of Dale's.

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A somewhat detailed description, with a plan of the larger building, may be found in Morgan's "Houses and House-Life of the American Aborigines," *Contributions to North American Ethnology*, vol. IV, 1881, p. 172.

<sup>1</sup> *Tenth Annual Report of the (Hayden) U. S. Geological Survey*, 1878, p. 387.

I have found no noteworthy ruins on La Plata River above this point.

#### RUINS ON THE MANCOS AND THE MESA VERDE

The next tributary to the San Juan from the north is the Mancos. This small stream rises in the western and southern slopes of La Plata Mountains and is the last, reckoning westward, of the San Juan tributaries which carries visible water throughout the year. The Mancos River runs for a few miles at the foot of the mountains through a small open valley in which lies the present village of Mancos; then for several miles it holds its way at the bottom of a narrow canyon dividing a lofty isolated plateau called Mesa Verde. On emerging from the canyon the Mancos turns westward down a great rugged open slope to join the San Juan.

A few boulder sites are scattered along the upper Mancos Valley near and below the village. These are for the greater part upon the gravel benches bordering the arable bottom, and the burial mounds have been much disturbed.

Several ruins along the Mancos Canyon and in the valley below were discovered by Jackson<sup>1</sup> and pictured by Holmes.<sup>2</sup> But it was not until later that Richard and Alfred Wetherill discovered in the walls of the side canyons of the Mancos, deep in the recesses of the western portion of the Mesa Verde, those great cave ruins which in size, complexity, and structural excellence are the most wonderful and imposing of the cave dwellings in the whole Southwest (see plate XXVIII).

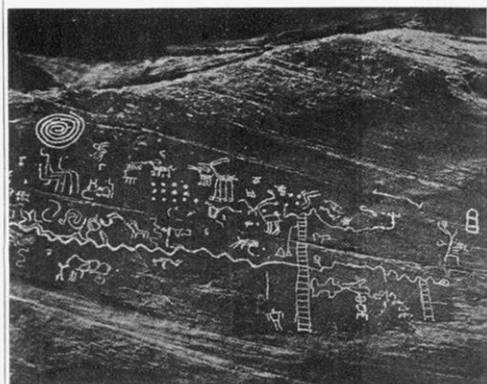
While the ruins are most abundant on the summits and in the canyons of the western segment of the Mesa Verde, there are several excellent cliff houses in the walls of the canyons entering the Mancos from the east.

The ruins of the Mesa Verde, together with the numerous small sites which are scattered along the banks of Mancos River below the canyon, are described in the superb work of Nordenskiöld<sup>3</sup> and need not be considered here. The accompanying map (plate XVI)

<sup>1</sup> *Report of the (Hayden) Geological Survey for 1874*, published 1876, p. 369.

<sup>2</sup> *Tenth Annual Report of the (Hayden) Geological Survey, 1875-76*, published 1878, p. 393.

<sup>3</sup> *The Cliff Dwellers of the Mesa Verde*, Stockholm, 1893



PETROGLYPHS FROM THE CLIFFS ON SAN JUAN RIVER AT THE MOUTH OF BUTLER WASH, UTAH.

shows the position of only the larger of the cliff houses and a part of the open ruins of the Mesa Verde, but the number and grouping of the smaller sites along the river are indicated.

#### RUINS IN MONTEZUMA VALLEY

A few miles west of the sharp western crest of the Mesa Verde rises the volcanic peak of the Sierra El Late, locally known as Ute Mountain ; between is a broad valley of erosion, called Montezuma Valley, draining in part southward into the San Juan, in part westward into the McElmo.

Low upon the eastern slope of the main peak of Ute Mountain lies the large ruin described and sketched by Holmes<sup>1</sup> and called Aztec Spring Ruin. This pueblo, the main part of which is somewhat more than four hundred feet square, can be justly compared with the ruin at Aztec on the Animas and with the great ruins of the Chaco. It is now much fallen. There is a trickle of water in one of the interior courts of the ruin, and water is usually abundant up the higher slopes of the mountain near by. There has been desultory digging in and about the ruin, but it is essentially intact and is situated on private land.

There are a few small scattered sites, as indicated on the map, in the valley between Mesa Verde and the southern spur of Ute Mountain ; a few far down on the southern and western slopes of the latter and a few high up among the piñons on its northeastern shoulder.

#### RUINS OF THE MCELMO GROUP

The next great drainage area west of the Mancos is the McElmo, which heads against the long slope dividing the waters of the Dolores from those of the San Juan. The stream turns westward through a narrow valley — McElmo Canyon — having the volcanic Ute Peak on the south and the high escarpment of a lofty mesa on the north. The country falls away as the river runs westward, and after receiving from the north a great branch, now called the Yellowjacket, the McElmo turns southwesterly through a broken hill country to enter the San Juan about twenty-five miles below the mouth of the Mancos. The broad valley of the Mc-

<sup>1</sup> Loc. cit., p. 399.



Elmo, before it passes into the canyon at the northern foot of Ute mountain, contains a considerable number of scattered ruins.

There is a group of considerable size at the top of the Dolores divide near the great bend in the Dolores River, and some small scattered ruins on the piñon-clad McElmo slope southward. The group of ruins at the bend of the Dolores has been mentioned by several of the early explorers of this region, as it lay on the line of the old Spanish Trail.

The largest of the McElmo ruins form a group located on the Wolley Ranch in the upper part of the valley where it slopes against the Dolores divide. The main building standing in the open valley bottom is about one hundred and thirty-five feet long and was probably two or three stories high at the back. It faces a court and mound southward. The masonry is of superior grade. The ground-plan is not evident since the walls are much fallen and covered with soil and brush. One corner of the ruin has been washed out, revealing well preserved floor timbers. There is apparently a row of lower rooms underneath the débris, which may be intact. There has been considerable digging about the ruin, but it still offers a promising field for systematic work.

Another large ruin, called Burkhardt's Ruin, is at the head of McElmo Canyon. This lies about the head of a small rocky gulch, is also composite, and together with other ruins in this vicinity has been described by Holmes<sup>1</sup> and by Morgan.<sup>2</sup>

Aside from these larger structures there are many small ruins, mostly of the "unit type," scattered along the western base of Mesa Verde, upon the gullies which descend from the mesa to the McElmo, as well as a series of scattered ruins near the present town of Cortez. Near a small group of the ruins at the foot of the mesa is a reservoir formed by a high artificial earth dam built across a shallow wash.

A large proportion of all the burial mounds belonging to the ruins in the upper McElmo Valley have been despoiled, some completely, some partially; but nearly all with the usual aims of the curious or commercial pot-hunter.

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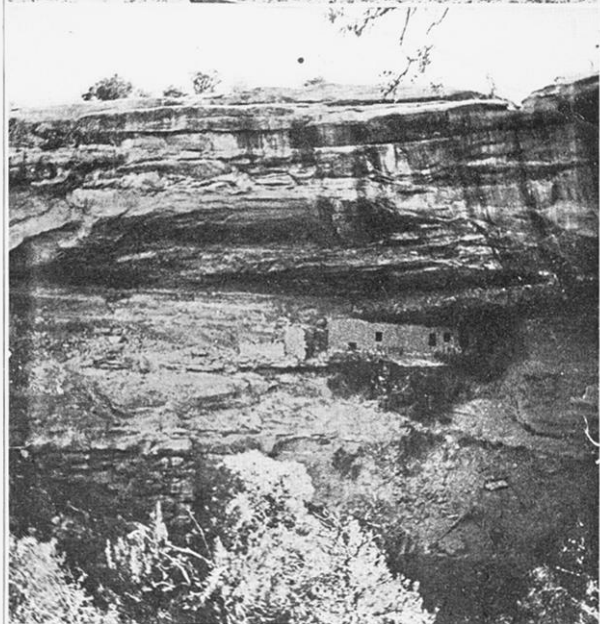
<sup>1</sup> Loc. cit., p. 398.

<sup>2</sup> Loc. cit., p. 189.

1



2



3



1, 2. Small cliff houses in Sand and Rock canyons—McElmo group, Colorado.  
3. Site of small fallen ruins of the "unit type" in a piñon clearing on the high mesa east of Montezuma Creek, Utah.

As will be seen by the map, a series of ruins are scattered along the bank of the McElmo from the head of the canyon to the entrance of the Yellowjacket. These ruins are for the greater part of the small "unit type." Their burial mounds have been much disturbed. There are a few small cliff houses scattered along the valley. In the valley bottom stands the great detached "Battle Rock" about which the tradition of a great battle between the aborigines and the Utes has gathered.<sup>1</sup> Near by is an isolated rock around which numerous small houses have been built. These are now much thrown down.

Coming into the McElmo from the high mesa north is a series of short rugged canyons. Several of these, notably Sand Canyon and Rock Canyon, contain numerous small, well-built cliff houses (plate xxxii, 1, 2). On the west side of Sand Canyon the foundations of a house have been laid in a small cave and some loose stones are lying at the back of the cave; but the building has remained unfinished. There are a few painted figures upon the walls in these canyons. There are two fairly well preserved towers on a rocky bench to the east of the mouth of Sand Canyon, one of which is shown in plate xxiv, 2.

At the heads of two of these side canyons of the McElmo are large ruins built upon the edge of the cliffs and partially down the slopes. These ruins stand virtually upon the top of the great mesa bordering the McElmo to the north. One is known as the Goodman Point or Goodman Lake Ruin; the other is, so far as I know, without special name.

*Goodman Point Ruin.*—Goodman Point is the highest part of the great mesa which rises from the north toward Ute Mountain, breaking down abruptly into the canyon of the McElmo close against the northern slope of the peak. It is into the face of this tilted mesa that the series of short canyons above mentioned have cut their channels.

The Goodman ruins are situated about the head of one of these canyons. It is here a shallow rock wash or gulch with gradually sloping sides. The main ruin is built around the head of the wash

<sup>1</sup> For a rendering of this tradition and a brief account of a reconnaissance of this valley in 1874, by Jackson, see *Report of the (Hayden) Geological Survey*, 1876, p. 369.

in two parts, separated by the rock sag through which the drainage from above enters the gulch. There are two compact clusters of rooms facing each other across the narrow wash. One of these is over one hundred, the other more than three hundred feet long, and each consists of from four to six rows of rooms from twelve to fifteen feet square. I could not determine the number of stories in this ruin, though it is largely uncovered. The walls are now much fallen. It must, however, have formed a most imposing group of buildings.

Back of the main group of rooms and lying upon the slope on one side is another almost equally large building, apparently of another period of construction, with a burial mound between them. Several small isolated buildings stand about the main structure. Near by is a round enclosure with low walls, about sixty feet in diameter, having four small stone heaps set within and near the wall in such positions as to form the corners of a square. Such a structure I have not seen elsewhere. This ruin has not been much disturbed. The masonry, so far as it is exposed, does not appear to be of high grade.

About half a mile up the wash from the ruin lies the ancient artificial reservoir, not infrequently still containing water, which is called Goodman lake.

*Unnamed Ruin on the Mesa West of Goodman Lake.*—At the southern edge of the great mesa, a few miles west of Goodman Point and at the head of one of the short canyons leading down to the McElmo,<sup>1</sup> is a ruin of considerable size. Here, as in the Goodman Ruin, there are two large blocks of rooms separated by a wash. These blocks are several rooms deep and may have risen two or three stories. Behind one of the groups, distant about four feet, is a wall somewhat fallen but apparently originally three or four feet high. Two small cliff houses are placed beneath the overhanging ledge upon which one of the great houses stands. The dimensions of this ruin I failed to obtain, but it is considerably smaller than the Goodman Ruin.

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<sup>1</sup> I am not certain upon which of these canyons this ruin is situated, since I have not descended at this point, but it is, I think, one lying between Trail and Mitchell canyons.

I have visited several small isolated ruins on the high mesa top between Goodman Lake Ruin and that last described, and there may be others since I have not yet fully explored this high, very rough, piñon-clad upland which lies between the McElmo and the Yellowjacket.

There is a large, much fallen ruin on a rocky slope at the junction of the McElmo and Yellowjacket. Several estufas are visible and there were many rooms, but the walls are much fallen. There is an opening among the rooms which leads into a narrow, sloping passage running down beneath the ruins toward the bed of the stream. This I have not explored. It is a curious and exceptional feature.

I have no record of ruins on the McElmo below the mouth of the Yellowjacket. A few small ruins have been reported to me along the district drained by the East McElmo. These I have not seen.

The McElmo is now for the larger part of the year a dry stream, the only water running in summer being that which is taken from the Dolores through a tunnel for irrigation purposes.

#### THE YELLOWJACKET GROUP OF RUINS

The Yellowjacket, which is the main tributary to the McElmo from the north, rises on the southwestern slopes of the Dolores divide, receives several tributaries from the north draining the high rough country which lies between the bend of the Dolores and the tributaries to Montezuma Creek, and enters the McElmo as the latter turns southwestward toward the San Juan. Neither the Yellowjacket nor its tributaries carry surface water except in the spring and for a short time after rains, but the open bottoms are in places arable.

The Yellowjacket is the stream called on Jackson's map<sup>1</sup> the Hovenweep; but the name Yellowjacket is now universally applied to it by the residents of this district, while one of the northern tributaries to the Yellowjacket is now called Hovenweep. I have used

<sup>1</sup> Map showing the location of ancient ruins in southern Colorado and Utah and northern New Mexico and Arizona accompanying the report of his reconnoissance in 1874, 1875, and 1877. *Tenth Annual Report of the (Hayden) U. S. Geological Survey.*

this revised nomenclature because it has already found currency on such of the local maps as have been made for surveying and other purposes.

The more important ruins, few in number and all small, in the lower portion of Yellowjacket canyon have been described by Jackson and need not be further mentioned here. Several small ruins are scattered along the valley bottom from the mouth of the Sandstone to three or four miles above the mouth of the Dawson. Throughout this region the canyon has a level and in places arable bottom, the walls rising from fifty to several hundred feet.

High on the northern bluff of the Yellowjacket, nearly opposite the mouth of the Dawson, stands a considerable group of ruins built partly on the edge of the bluff, partly down the upper portion of the higher slopes, with a series of tower-like structures (plate XVIII, 2), reaching down into the valley. This is one of the larger of the ruins which stand upon the mesa top overlooking the intervening country to the summit of Ute Mountain. There are two long buildings, each two to three rooms deep, separated by a shallow wash coming from the mesa top behind. One of the buildings is more than three hundred feet, the other nearly two hundred feet long. There are several estufas among the rooms along the slope. In a number of the rooms and buildings of the group, timbers are still to be seen, fallen in upon the ruins. A few feet behind both of the ruins, on either side of the wash, is a fairly well preserved wall built in zigzags, the arms of the zigzags being of unequal length—from six to twenty feet long. In the slight depression in the mesa top behind the wall is an artificial reservoir, about ninety feet across, formed by a low dam of earth.

At the head of Yellowjacket Canyon where its walls are only a few feet in height, on a narrow tongue between two branches and near a spring, are the so-called Yellowjacket Spring ruins. They are on the line of the old Spanish Trail and are frequently mentioned by the early explorers in this region who called them by the Indian name Surouaro, which according to Newberry<sup>1</sup> signifies "desolation."

The main ruin consists of a series of five clusters of irregularly disposed houses, in part closely crowded together and conforming

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<sup>1</sup> Loc. cit., p. 88.



in most instances to the "unit type" or to variants of this. Though close together, each house has its own *estufa* and burial mound lying southward. The lateral wings of many of the houses are long, sometimes enclosing a court containing several *estufas*.

Several of the houses are modified by the introduction of a round tower. In some a low wall unites the prolonged lateral wings enclosing the small court of the *estufas*. Most of the walls are largely fallen. I estimate that this village contains in all its various buildings not fewer than three hundred rooms. There are several buildings of irregular shape, one of considerable size, at the edge of the canyon above the main group.

The burial mounds of this village are large and conspicuous. A thin stone slab was laid over many of the bodies or the latter were enclosed in a loosely laid stone cyst before being covered in their graves.

Few of the mounds have escaped the hands of the destroyer. Cattlemen, ranchmen, rural picnickers, and professional collectors have turned the ground well over and have taken out much pottery, breaking more and strewing the ground with many crumbling bones.

While the scientific value of these ruins has been thus seriously impaired, they still remain of much interest on account of the modification in form which the primitive building fashion here shows, due, as it seems to me, to the limited surface on which the large number of houses of the "unit type" were crowded.

#### RUINS ON THE TRIBUTARIES OF THE YELLOWJACKET

There are several short canyons draining the high country between the McElmo and the Yellowjacket, most of them heading abruptly in cliffs of varying height. In some of these, as well as in the tongue-like mesas between them, are ruins, some of the "unit type," some towers, some irregular clusters of houses on the edges of the cliffs, and a few small cliff houses. Only a part of these side canyons to the Yellowjacket from the south are named. The ruins at the head of the first above its mouth, called Cannonball Canyon, are the best known and most noteworthy (plate XXII). They are of the type especially characteristic of this region, being irregular clusters of rooms, often associated with towers, built around the heads of shallow gulches.

The longer tributaries to the Yellowjacket rising in the country to the north, are named, commencing at the lowest, Ruin, Bridge, Hovenweep, Nigger, Sandstone, and Arch Rock canyons. Most of them start in broad drainage basins, with moderate fall, running thus for several miles down the long slopes of the Dolores divide. Then they break suddenly at the abrupt head of a rocky gorge, which in some cases continues thus for several miles, in others open out here and there into arable intervalles from half a mile to a mile wide. Most of these tributaries are rough walled and narrow canyons for a few miles above the junction with the Yellowjacket, and in these portions there are few ruins. Such as exist are small and inconspicuous, consisting of single rooms and small clusters.

The first three of the northern tributaries to the Yellowjacket, Ruin, Bridge, and Hovenweep canyons contain the most interesting and noteworthy ruins; those in the upper valley of the Nigger and Sandstone, and those along the edges of Arch Canyon being small valley ruins of the "unit type," or small rooms and towers perched upon the edges of the narrow canyon cliffs.

On the two terminal branches of Ruin Canyon are noteworthy groups of ruins consisting of towers and larger and smaller buildings, some skilfully built upon isolated rocks (plate xxiii).

The lower eight miles of Bridge Canyon contain no noteworthy ruins, but there are clusters of well-preserved buildings on both forks where the canyon boxes. Here are several well-preserved towers and rooms and clusters of rooms close upon the edge of the cliff. This region is locally known as the Hawkberry. A spring trickles out in a shallow cave in the canyon bottom near the ruins.

There is a long line of ruins of the "unit type" on the height of the great mesa which extends northward between the headwaters of Bridge Canyon and those of the Hovenweep. These are situated from a few rods to over a mile apart. No water supply is evident on the top of the mesa, but the small side canyons which may contain water are not far away.

The Hovenweep runs for the last twelve miles of its course in a low-walled canyon in which are few ruins, but above this point it opens out into a level valley with several small accessible springs. In this valley along the cliffs (plate xxiv, 3), upon the high mesas on

either side, and upon its short tributaries are several small ruins and a few large clusters. There are several towers here. One of these (plate xxiv, 1), with a group of fallen walls about its base, stands in the valley bottom and forms a conspicuous feature in the meadow landscape, about three or four miles above the upper end of the canyon. There is a small ruin on the crest of the ledge east of this tower.

Less than a mile below this tower a small gulch enters the Hovenweep from the west. A short distance up this side gulch is a small spring and near by a group of ruins on a projecting point at the forks of the valley. The ruins are in two groups, each of which must have contained at least fifty rooms. The walls are much fallen, but in places stand so high as to justify the belief that the buildings must have been two or three stories in height at the back. No burial mound could be discovered. There are two ruins among the piñons on the mesa top west of this group, one of which is about one hundred and seventy-five feet long with a large undisturbed burial mound. The other ruin near by is small.

Far up the Hovenweep are two considerable ruins facing each other across the valley. The ruin on the west side is a rambling mass of rooms built upon a projecting rock crest high above the bottom and extending partly down the slope. The ruin on the east side of the valley is built mostly upon a low, narrow, projecting tongue of rock. The grouping of the rooms appears to be wholly irregular. The main group consists of some twenty rooms averaging ten feet square, while a considerable area on the southern slope is covered with fallen walls. A low wall runs across the base of this rock tongue, barring access to the ruin from the back. No burial mound was discovered in the vicinity.

Just above this ruin is a well-defined artificial ditch, evidently designed to conduct water from the next draw above around the intervening spur to the vicinity of the ruin. On the hillside across which this conduit runs are constructed a series of reversing zig-zags which were apparently designed to turn the water abruptly back at short intervals so as to lead it by gradual stages down the slope to the point of delivery.

The burial mounds in many of the widely scattered ruins of the Yellowjacket group have been partially dug out in search for pottery.

## RUINS IN PIÑON CLEARINGS

It is especially upon these great piñon-covered uplands of the Yellowjacket and Montezuma Creek region that one encounters a feature in the environment of these ancient dwelling places which is interesting and may be of significance in the determination of their period of occupancy. I refer to the situation of many of the ruins in larger and smaller sharply outlined clearings in the piñon timber.

These clearings (plate xxxii, 3) are now mostly overgrown with sage-brush and other low shrubs which cover the burial mounds, usually leaving free only the ruins themselves and the shallow pits of the estufas. The clearings vary in size, but in general correspond to the size of the ruin. Thus a ruin of the "unit type" with one or two estufas and from four to eight rooms on the back is usually surrounded by a clearing from fifty to one hundred yards across, while larger clusters of ruins have proportionately larger spaces about them.

This condition seems to me to be of significance in its bearing upon the probable age of these ruins. Two possibilities are evident in this connection. The clearings may have been made in the piñon forest to make room for the buildings and the necessary space about them. Or, on the other hand, the piñon growth may have taken place since the construction of the buildings, sparing their immediate surroundings because the solid trampling of the ground about them has rendered a limited area unfitted for the growth of piñon seedlings. I have observed this condition only in the ruins of the older and simpler type which, as judged by large burial mounds, have been long occupied.

How solidly trodden the earth may become about old habitations of similar people is well known to those who are familiar with the Southwest and its present aboriginal residents. Furthermore, this is a region in which the soil in many places is still forming over the bare rock surfaces, so that many of the piñon uplands are doubtless now for the first time timber clad.

Rarely in these clearings, though occasionally elsewhere, piñons of considerable size have grown close about and even in and upon the ruins of the older type.

I have not been able to form a definite opinion as to the significance of these open sage-brush clearings in the piñons, which invariably contain ruins. They occur in densely clad piñon regions where, save for these and some of the natural sage-clad meadows in the ground sags of the upper water-courses, the piñon timber stretches uninterruptedly for miles.

#### RUINS OF THE MONTEZUMA CREEK GROUP

Montezuma Creek drains the great barren upland lying between Dolores river and Abajo Mountain, as well as the eastern slopes of the latter. It is an arid and forbidding country, covered mostly with sage and piñon, and with but few and widely-scattered watering places. On these great uplands, drained by the eastern tributaries of the Montezuma, there are, as the map indicates, few ruins.

There are a few small scattered valley sites and small cliff houses along the upper branches of Cross Canyon and a few in the lower reaches of Cross Canyon, commonly known as East Montezuma. I have ridden over the northern part of this region and am assured by reliable cattlemen who have long ranged these uplands that there are few if any ruins, and these small, on the southern ends of the great mesas which lie between the eastern tributaries of Montezuma creek: namely, Cross, Pierson, Bug, Coal-bed, Horse-head, and Boulder canyons. Along the upper reaches of these mesas, however, which I have explored, there are a few small ruins, partly in the narrow canyon bottoms, partly upon the tops of the mesas.

Two of the ruins in this region are large and in many respects noteworthy: one lying about the middle of the mesa between Dove Creek and Pierson Canyon, locally known as the Pierson Lake Ruin; the other on the mesa between Pierson and Bug Canyons and known as Bug Lake Ruin. These ruins are some distance away from the regular trail across the country from east to west and are little known.

*The Pierson Lake Ruin.*—This ruin is situated upon the lofty piñon- and sage-clad mesa which rises between Cross and Pierson canyons and is in direction a little north of west of the point at which Dove Creek enters Cross Canyon.

The so-called Pierson Lake is a surface of bare, sloping rock upon the top of the mesa of some two acres in area, around the lower parts of which an artificial dam of earth has been made. This dam, in the form of a broad embankment, is from four to six feet high, is well preserved, and gives no evidence of modern repair. The reservoir thus formed receives the drainage of a higher slope of earth and rock, so that a considerable amount of water is still to be found here for a part of the year — a circumstance of great advantage to cattle-herders in this district. Close beside this reservoir are two ruins of the "unit type," each with several rooms along the back, short wings, and one estufa. The mesa about the lake is covered with piñons.

The Pierson Lake Ruin, a short distance from the lake, presents a rather imposing mass of fallen stones, in which, however, the general form of the walls may be made out. The ruin faces southward upon a shallow surface water-course. The building had, I should judge, between two hundred and fifty and three hundred rooms. These are quite irregularly arranged, but in general formed a compact group about three hundred feet square. At one side of the building the rooms are arranged in a series of long rows, closed at the back and apparently forming a group of narrow courts opening southward. At the other or western side the rooms are built without evidence of significant arrangement in a compact mass. Between these two portions of the ruin runs a passageway opening southward upon a small court in which is a burial mound. Another burial mound of considerable size lies to the west of the ruin. A small isolated building stands southeasterly across the dry wash on which the ruin fronts. The masonry of this ruin, so far as one can see, is rather carelessly laid, and the walls do not appear to have been of great height.

About three hundred yards west of the main ruin in a piñon clearing is another ruin about one hundred feet long at the back, with short wings at the ends and a row of probably nine estufas between the wings. This ruin is much fallen, and there are so few building stones about the site that it seems not unlikely, considering the large size of the ground-plan, that they have been carried off for use in the large pueblo which is apparently of much more recent construction.

On a low ridge northwestward of the large pueblo a few hundred yards, in a sage-grown clearing in the piñons, are several small ruins scattered up the slope. These are much fallen and overgrown with sage-brush; but they are clearly of the "unit type" and stand as isolated structures. Apparently, none of the burial mounds in this group has been disturbed.

This entire group of ruins is now surrounded by the piñon forest save in the immediate vicinity of the buildings, and has an outlook only toward the Sierra Abajo. There is no living water apparent near the ruin, but Pierson Canyon and Dove Creek are not far away and in these water may be found. There are a few small ruins scattered over this mesa north and east of the Pierson group.

*Bug Lake Ruins.*—These ruins stand upon the high mesa between Pierson and Bug canyons in a direction easterly from the Pierson group which in many respects they resemble.

Bug Lake is, like Pierson Lake, an artificial reservoir about one hundred and fifty feet across, formed on the sloping bare rock surface of the mesa by a dam of earth from three to five feet high. Like Pierson Lake also the water still gathers in it during rains and it likewise is used by the cattlemen.

The ruin is about one-eighth of a mile southeasterly from the lake. The main ruin is composed of two groups of buildings facing one another across a small water-course. Many of the walls are standing several feet in height, the outline of the rooms being plain. Many timbers of roofs or floors are still present among the fallen walls, but are much weathered. The larger portion of the ruin forms a fairly compact mass facing southeasterly. It is about four hundred and fifty feet long and apparently must have contained some three hundred or more rooms. The general arrangement of the rooms is that of small, rather irregularly placed groups of circular estufas, each group surrounded by a somewhat irregular mass of rooms. These groups are ranged side by side, some of them being separated by narrow passageways leading from the back to a court on the southeast of the pueblo about sixty feet across, which contains a burial mound. One end of the great building seems to be much more weathered and of older construction than the other and is surrounded at the back by a low wall. This wall



a few feet away from the building may have been three or four feet high. It is now much fallen.

Across the wash from the large pueblo are several smaller isolated buildings. Two of these buildings stand about forty feet apart on ground which slopes toward the wash, and between these buildings an artificial dam has been thrown, forming a reservoir of considerable capacity, receiving the drainage from the piñon slope behind the buildings. There is also, still largely intact, a dam across the shallow wash upon which this group of ruins stands, capable of holding a large amount of water upon the gentle slope of the stream-bed above.

To the westward of this main ruin, two low gravel benches, each a few feet in height, rise one behind the other. The piñons are cleared upon these benches over an area of about five hundred yards in length and from two hundred to three hundred yards in breadth. The clearings are covered with sage-brush.

On the first of these benches, perhaps two hundred yards from the main ruin, is a group of at least five isolated buildings of the "unit type." Each has one row of rooms at the back, short wings, and from two to four estufas. While somewhat irregularly placed, they all face southward. I discovered only one burial mound in this group, which is at the front of the group near the southern edge of the bench. The buildings are all much fallen and dirt-covered. The estufa pits are circular and are now from two to five feet deep at the middle. There are fewer building stones here than is usual in ruins of this size.

On the second bench is another group of widely scattered houses of the "unit type," each with two or three circular estufas. I found in this group separate burial mounds scattered among the houses. These had been slightly dug into here and there but not seriously injured.

This Bug Lake group of ruins seems to me, especially when taken in connection with the Pierson group, to be of peculiar interest because it confirms the impression of different periods of occupancy of a site which has been advanced upon a previous page. There are here upon the upper benches, ruins of the old "unit type" — rectangular, short-winged, with circular estufas in the

court. On the highest bench the burial mounds are separate for each house, while upon the lower, so far as I was able to discover, there is but a single mound for the whole group of dwellings. The ruin situated upon the wash, on the other hand, shows the massing of rather atypical individual clusters of rooms and estufas to form a large and fairly compact pueblo with a burial mound in the southward-looking court. It would be of great interest to know from systematic excavations what a comparative study of the burials as well as of the ruins might reveal as to the relationship in time and culture of these associated ruin groups.

There are a few small ruins on the mesa between Bug and Coal-bed canyons, along an old trail leading down to the valley of Montezuma Creek.

#### RUINS IN MONTEZUMA CREEK VALLEY

The long, narrow valley of Montezuma Creek is dry a large part of the year save near its sources in the mountains and in a few places here and there where the underground flow comes to the surface in the sandy stream-bed. But the alluvial bottom is in many places arable from natural deep irrigation or the seepage from side canyons.

The general character of the ruins has already been indicated by Jackson in his early report. They are mostly of the "unit type," standing on the alluvial bottom or on the low cliffs at the sides. They are most abundant in the middle third of the valley where in places they are very thickly clustered along the stream-bed. Some of them are much washed.

I have not been able to find or hear of ruins, other than a few small sites, on the slopes of the Sierra Abajo above the mouth of Boulder Creek.

Here and there in the valley are buildings of considerable size, and there are several fortified rocks and small isolated houses.

At the entrance of the Coal-bed Arroyo stands an isolated butte about fifty feet high, having a flat top of two or three acres in area. The top and sides of this butte, which is known to the modern frequenters of Montezuma Creek valley as the "Island," are covered with a series of irregular and complex buildings. A few feet outside of one of these buildings is a row of stone slabs set five to six

feet apart. They are still mostly erect, standing from four to six feet high. They are from six to seven inches thick and from fourteen to eighteen inches wide. A lower, loose stone parapet, in places intact, is built in between these slabs, the whole forming a continuous wall barring access to the ruins upon this segment of the butte. Another wall of similar character, but less well preserved, is placed in a like defensive position at the opposite end of the butte. At one side, where the cliff is most abrupt, a well-built and still fairly preserved stone trail leads to the top. Commanding the turns of this trail from several points are flat projecting rocks on which are still piled heaps of rough stone, not belonging to buildings. These I conjecture to have been placed here for defensive uses. Barring projectiles, a few men placed at these stone heaps could most effectively prevent access to the top. There is much broken pottery about this ruin.

At several other places in this valley large stone slabs have been used in construction. Two instances of this are described and figured by Jackson.<sup>1</sup>

One of the largest of the valley ruins is east of the stream-bed between the mouths of Bug and Pierson canyons. This ruin measures about three hundred and seventy-five by one hundred and ninety feet. There were probably over two hundred and fifty rooms and ten or more circular estufas irregularly placed. The ruin and burial mound have been much disturbed by excavation.

At the upper part of the residential portion of Montezuma Valley, where for a considerable distance the alluvial bottom is wide and the stream water near the surface, small ruins of the "unit type" are numerous. Near the upper end of this group, near the arroyo and partly washed out, is a compact group of ruins about three hundred feet long, in which the remains of from six to eight estufas and over forty rooms are visible. The burial mound is large.

At the mouths of several of the small creeks running into the Montezuma from the high mesa on the west are small valley sites with a few small cliff houses. There are also a few small ruins on the mesa tops between the upper reaches of Devil and Alkali canyons.

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<sup>1</sup> Loc. cit., p. 428.

At the head of the short canyon north of the Alkali, which I have called Jackson Canyon, is a large ruin formed of two buildings facing each other across a shallow wash. Each building consists of an irregular mass of rooms about two hundred feet long, with low towers among them (plate XXI, 1). I estimate this ruin to have contained over one hundred and fifty rooms. The burial places were not discovered.

There are scattered pictographs in several places along Montezuma Valley.

A considerable proportion of the ruins and burial mounds have been devastated by relic seekers, although many still remain intact.

#### RUINS ON RECAPTURE CREEK

The reconnaissance map of the United States Geological Survey is inaccurate in regard to the source of Recapture Creek. On the map this rises only a few miles above the San Juan, whereas, in fact, it is the great drainage stream for the southern slope of Abajo Mountain. The government map carries the drainage of this region into Montezuma Creek, which is incorrect. The lower portion of the Recapture, like the Montezuma and the Cottonwood, is a dry wash with underground flow for most of the year.

The Recapture rises at the base of the high peaks with rapid descent and, after union of the main tributaries among the higher foothills of the mountain, runs through a well watered open park several miles long, and then enters a rough, narrow, and tortuous canyon with precipitous walls. Here for a few miles are numerous ruins, mostly small cliff houses and small valley sites showing nothing unusual in type. Farther down the stream the canyon walls are lower and the bottom widens. Here and there are a few small and scattered sites. Some twenty miles above its mouth, small sites are clustered and are strung along the valley bottom for several miles, as is indicated on the map. Thus the valley sites and the cliff houses of the Recapture while fairly numerous are nearly all small.

There are, however, a few ruins of considerable size. One of these, situated a short distance above the point where the Bluff-Monticello road leaves the Recapture, contains from thirty to forty rooms.

Another ruin, two or three miles below the mouth of Mustang Spring Canyon, stands upon a rocky point above and west of the arroyo, and consists of three groups. The largest of these, a boulder site, is about one hundred and eighty feet long and much fallen; another is about sixty feet long; while the third, back of these and apparently of older construction, is formed of scattered buildings whose outlines are not well defined. There are large mounds, but little dug, associated with this ruin.

Most of the burial mounds along the lower reaches of Recapture Creek have been dug in desultory fashion for commercial purposes.

#### RUINS ON COTTONWOOD CREEK

Cottonwood Creek, which enters the San Juan at the present Mormon town of Bluff, is a long stream draining the western slopes of the Abajo Mountains. Its sources are incorrectly indicated on the Geological Survey map, where they are represented as draining into Butler Wash.

The lower reaches of Cottonwood Creek are low-walled and contain a few small valley ruins and small cliff houses. Commencing some twenty miles above the mouth, the valley sites, mostly small, become more numerous and are scattered along the bottom for several miles. One ruin on a high gravel bench below the mouth of Dry Wash contains from fifty to sixty rooms.

In branches of the Cottonwood near its sources — Allen, Hammond, and Cottonwood canyons — are numerous cave-like recesses in the cliffs bordering the valley. Several of these are at the level of the alluvial bottom. In some of these caves no ruins are visible; in others small cliff houses or remnants of such are present. It is in these caves, and sometimes when these are present beneath the walls of the ruins, that the burials of the so-called "basket makers" have been found by Wetherill, Lang, McLloyd and Graham, and others. Many relics of these ancient people have been taken out of the caves in this region, some of which, under the auspices of the Hyde Exploring Expedition, have been placed in the American Museum of Natural History in New York City.<sup>1</sup>

<sup>1</sup> See Pepper, "The Ancient Basket Makers of Southeastern Utah." Supplement to *American Museum Journal*, vol. 11, No. 4, April, 1902.

There are a few small ruins on the high mesa between the Recapture and the Cottonwood at the foot of the Abajo Mountains, and there are said to be a few scattering sites, which I have not seen, southward along the mesa.

#### RUINS ON BUTLER WASH

Butler Wash is a narrow, dry, shallow valley, having on its western side the sloping uplift of a great fault. Along the eastern base of this slope is a series of small valley sites mostly situated at the mouths of short canyons coming from the slopes of the uplift. In many of these canyons are larger and smaller caves containing cliff houses and burials. One of the caves far up the valley, which is very large, formerly contained a large ruin and many burials. The burial mounds in Butler Wash have been much devastated. Some of them have furnished relics of the "basket makers." In the upper reaches of the Butler there are no noteworthy ruins. There are a few painted pictographs in some of the caves.

#### RUINS ON COMB WASH

Comb Wash was formerly called Epsom Creek ; but it is now so universally known by the former name that I have retained it on the map. The valley, from one to five or six miles wide, is shallow and dry and is bordered on the east by the serrated summit of the great fault which, running from the divide between Abajo Mountain and Elk Ridge, turns southwesterly, crossing the San Juan, and runs in the direction of Marsh Pass. On the west the country rises from the valley of Comb Wash in lofty brown and barren swells up to the high mesa at the foot of Elk Ridge. There are a few small ruins at the mouth of Comb Wash ; then up the stream for several miles there are none. Near the head of the valley are several scattered sites. Some of those in the valley bottom and on the tributaries from the west are mentioned by Jackson. They are mostly valley sites, with a few small cliff houses in the side canyons of Elk Ridge.

#### RUINS IN GRAND GULCH

Grand Gulch is the westernmost of the large northern tributaries to the San Juan. It heads in the long mesa slopes south of Elk Ridge, the canyon breaking high up and descending rapidly. The

canyon is narrow and tortuous, with walls several hundred feet high. Water is usually to be found in places throughout the year. The area of arable bottom is small.

The greater part of the ruins, as indicated on the map, are clustered at and below the main forks of the canyon. They are mostly in large caves, the ruins themselves being for the greater part quite inconspicuous. But here and in the country at the head of the Cottonwood and in some of the caves of Butler Wash, have been found most of the relics of the so-called "basket makers." They are often buried beneath such ruins as are visible.

There are many pictographs, both graven and painted (plate xxxiii, 1), on the walls of the cliffs and caves of Grand Gulch.

In one instance, the spiral figure, either carved or painted, so frequent throughout the entire region, is here made while it was yet soft upon a thin disk of adobe plastered on the face of the rock (plate xxxv, 1).

Excavations have been extensively carried on in the caves and among the rocks of Grand Gulch, and a large amount of material has been removed. Much of this is in the Hyde collection in the American Museum of Natural History, while some is in the Field Columbian Museum in Chicago.

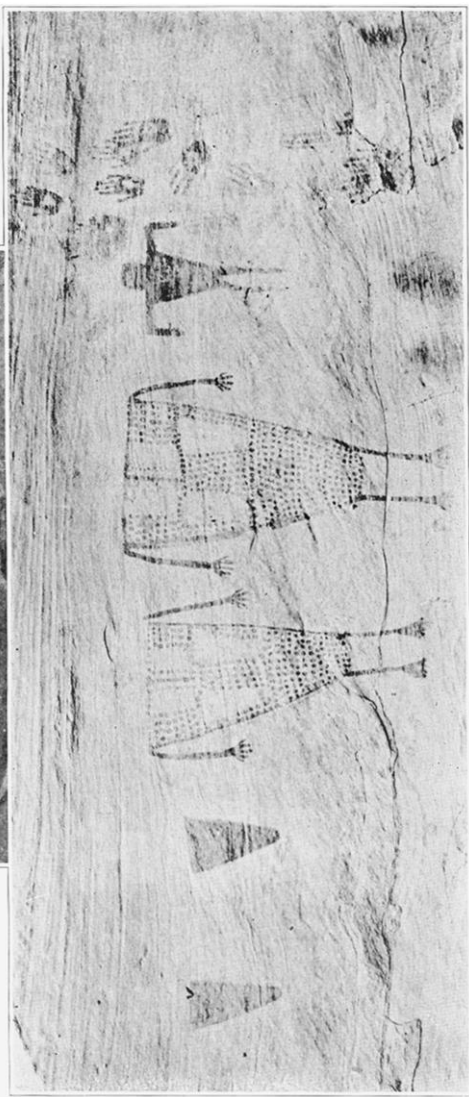
The high mesa country on either side of Grand Gulch is dry and forbidding, and I have not found nor have I been able to get information of any considerable ruins here.

Beyond Grand Gulch the vast tract to the west and south of Elk ridge, reaching to the Colorado River, is high, waterless, barren, and much broken by rugged canyons which penetrate from the Colorado. I have been down White Canyon to Dandy Crossing, and my guide, Clayton Wetherill, has traversed the country south and east. With the exception of a few small ruins near the mouth of White Canyon and a few cliff houses near the Colorado River not far from Hall's Crossing, we have not found evidences of dwellings.

#### RUINS ON THE SOUTHERN TRIBUTARIES OF THE SAN JUAN

Along the easternmost of the southern tributaries of the San Juan which come from the high broken country forming the Continental Divide, there are no ruins so far as I have been able to dis-





1. Petroglyphs from the wall of a burial cave in Grand Gulch, Utah.
2. Pictographs painted on the cliff near a shallow burial cave ("Princess Cave"), Grand Gulch, Utah. Faint outlines in white of the entire figure to the left may be made out, with spreading head ornaments.

cover. I have heard from three sources of two or three small ruins in Gobernador Canyon, but have not visited them. I have traversed the eastern tributaries to Canyon Largo, called on the government map *Compañero*, but now known locally as *Carriso Canyon*, finding a few small scattered valley sites and cliff houses in positions indicated on the map. On the upper reaches of the valley there are several fairly well preserved pictographs (plate xxxv, 2) associated with small ruins. I have neither found nor have I been able to learn from cattle and sheep men of any ruins on the high mesa lying between *Compañero* and *Largo* canyons. There are two small ruins at the entrance of the *Tapacipa* into *Canyon Largo* and two small ruins farther up the small valley coming in from the west. Below this point I have found none in *Canyon Largo*. I have not personally examined the upper reaches of the *Largo*, which runs for many miles to the southeast; but have heard of a few small sites from those who have followed the canyon to its head. I have traversed the entire length of *Canyon Blanco*, finding no ruins.

The great stretch of high mesa country lying between *Canyon Blanco*, the *Chaco*, and the *San Juan* is almost wholly devoid of ruins. The country is very dry, save for temporary pools upon the level summits after a rain, is high and open, and lacks such sheltered valleys as are characteristic of the sites of most of these ancient pueblos.

#### RUINS ON THE CHACO

The ruins of the *Chaco* region are largely confined to the middle portion of the eastern branch. One large ruin (*Pueblo Pintado*) lies near the stream far up the valley, but most of the others are clustered, as indicated on the map, above the mouth of the *Escavada*. These ruins, the first authentic account of which was given, with sketches of some of the buildings, by Lieutenant Simpson in 1849,<sup>1</sup> were described in detail with outline plans of the great pueblos by Jackson in 1877.<sup>2</sup> The description and plans of Simpson and Jackson are largely reproduced by Morgan.<sup>3</sup> These drawings of the great *Chaco* ruins made by Simpson and Jackson, while

<sup>1</sup> *Report of the Secretary of War*, 31st Congress, 1st Session, Doc. No. 64.

<sup>2</sup> *Tenth Annual Report of the (Hayden) U. S. Geological Survey*, 1878, p. 431.

<sup>3</sup> *Houses and House-life of the American Aborigines*, 1881, p. 155.

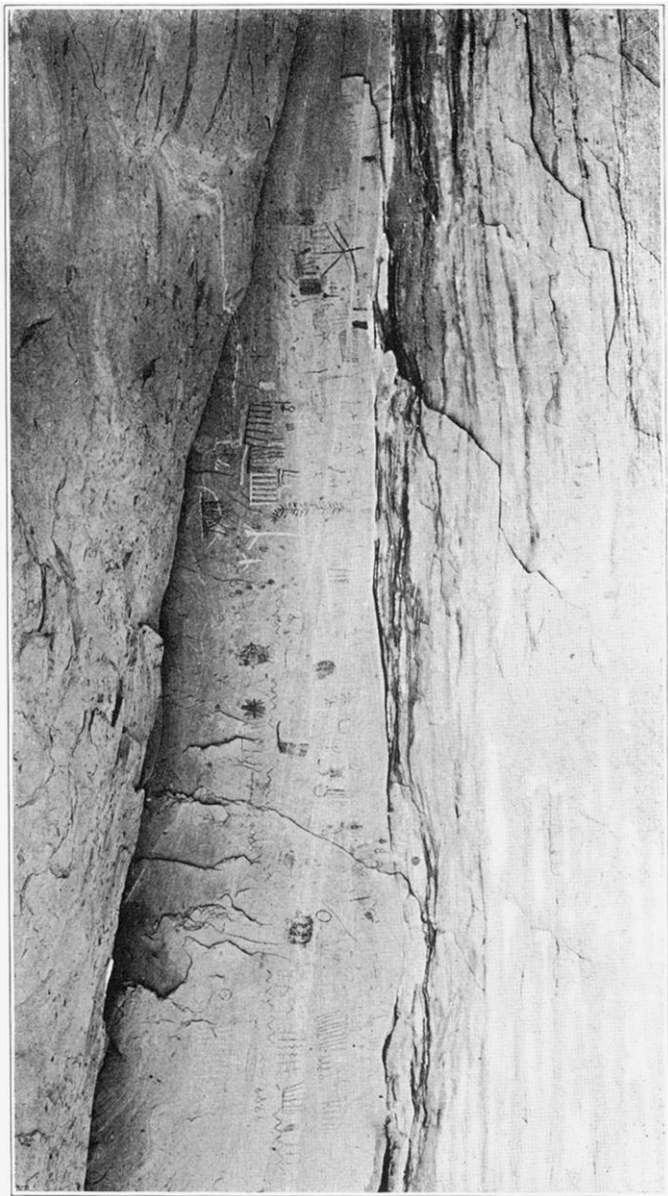
admirable records of a hurried examination, are not to be taken as accurate in detail, since all of the ruins at the time of their visits, as at present, were much fallen and covered with masses of débris.

They form the most impressive and noteworthy group of buildings on open sites in the entire San Juan district. With the exception of the ruin at Aztec on the Animas, these several-storied structures present more massive piles of masonry and more standing walls than any others, and mark the attainment of considerable constructional skill on the part of the old house-builders (plates XIX, XXVI).

These ruins remained practically untouched until the careful and systematic excavation of one of the largest — Pueblo Bonito — was begun by the Hyde Exploring Expedition. This work has already been most fruitful in the development of our knowledge of prehistoric aboriginal life in America which is of the highest interest. The large and valuable collection of material from this ruin is deposited in the American Museum of Natural History in New York City, where, under the immediate charge of Mr George H. Pepper, the accomplished Assistant in Southwestern Archeology, it is being classified and studied.

It is not necessary for the purposes of this paper to further dwell on the group of ruins of the Chaco region, since they will no doubt be presently described in full as the result of the explorations of the Hyde Expedition. It should, however, be said that, as indicated on the map, the ruins of the Chaco Valley at this point are by no means confined to the great communal pueblos which have attracted most attention. As the map shows, a large number of small open sites, many of them presenting the "unit type," are scattered about the edges of the valley, more particularly on its southern side, and strung along the high mesa to the north. There are numerous scattered pictographs on the cliffs of this part of the east branch, sometimes called Chaco Canyon.

The valley bottom in the vicinity of the great group of ruins is level, and in many places arable; and while in summer the stream-bed is mostly dry, a little digging through the sand exposes here and there an abundance of ground water of excellent quality.



PICTOGRAPHS PAINTED NEAR BURIAL CAVE ("PRINCESS CAVE"), GRAND GULCH, UTAH.

Three large pueblos are situated, as indicated on the map, along the course of the Kin-be-ni-o-li, one of the great southern tributaries to this arm of the Chaco. There are a few small sites close under the mesas to the south of this portion of the Chaco valley — that region overlooked by Hosta Butte. There are also a few small ruins scattered along the bottom of the east branch of the Chaco below the mouth of the Escavada Wash. The main wash of the Chaco runs through a broken, dry, and barren region, and from its sources to its junction with the San Juan there are, so far as I know, no noteworthy ruins, with the exception of a group of considerable size at the lower end of the river and one small site near the mouth. Along the benches of the washes coming into the Chaco from the foot-hills of the Luckachucki and Tunitcha Mountains, there are a few scattered and for the greater part small sites. One of the largest and most interesting of these is on a gravel bench four or five miles north of Sheep Spring. Here are two main groups: one, one hundred and fifty feet long; the other about two hundred and twenty-five feet long. On the valley bottom south of these are several sites, mostly sand-covered.

Going northward along the foot of the range here, one comes, as the map indicates, upon small scattered sites. Another large group, with abundant water supply, is situated near Mitten-rock. Near the latter is a curious collection of small, square enclosures with low stone slabs about them. There are a few small sites in the vicinity of Ship-rock, several, also small, in Black Horse Valley between the Luckachucki and the Carriso Mountains, as well as a series of small sites strung along the southern and eastern foot-hills of Carriso Peak.

#### RUINS OF CHIN-LEE VALLEY

The most important group of ruins in the Chin-lee watershed is to be found in Canyon de Chelly and its tributary, Canyon del Muerto. The general character of the ruins here, in part in caves in the cliffs, in part in the form of valley sites, has been described at length by Mindeff.<sup>1</sup> There has been comparatively little digging in and about them except in the so-called Mummy Cave in the Canyon del Muerto, which has been extensively ravaged.

<sup>1</sup> *Sixteenth Annual Report of the Bureau of Ethnology*, 1897, p. 79.

The number and grouping of these ruins on my map is largely based on Mindeleff's chart. The space, however, has not permitted the distinction between cliff houses and open sites which is indicated on the map in most other regions of the watershed.

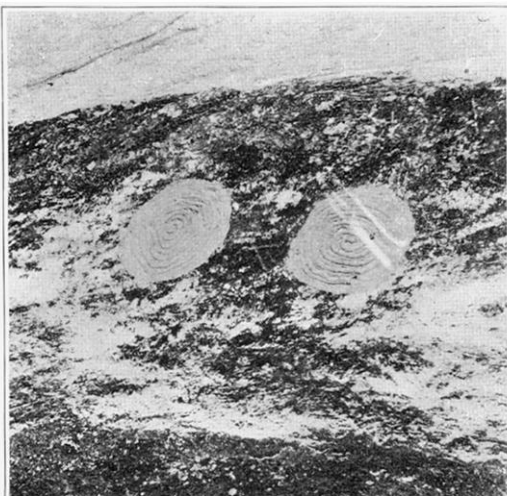
I have explored nearly to its sources Nashlini Creek, which enters the Chin-lee above the mouth of the Canyon de Chelly. There are near its head two or three small buildings on the edges of the cliffs and two small cliff-houses. There are also several small houses in a canyon opening into the Chin-lee, a short distance south of the mouth of Canyon de Chelly. On the western side of the upper reaches of Chin-lee Valley, against the eastern foot-hills of Zilh-le-jini Mesa (Mesa La Vaca), are a few small ruins — cliff houses and small valley sites — near small springs and water-holes. Some of these I have visited. I have been told by the Navahos that a few similar small sites are scattered near the mouths of the small canyons which emerge from the northern face of the mesa, also near springs. In two of the small canyons below the mouth of the Canyon de Chelly are a few small cliff houses.

A thorough exploration of Carriso Creek to its sources shows a few small boulder sites scattered along the stream from its issuance from the foot-hills to its entrance into the Chin-lee. None of these ruins is large. Those in the upper reaches are altogether valley sites. Lower down there are a few cliff houses.

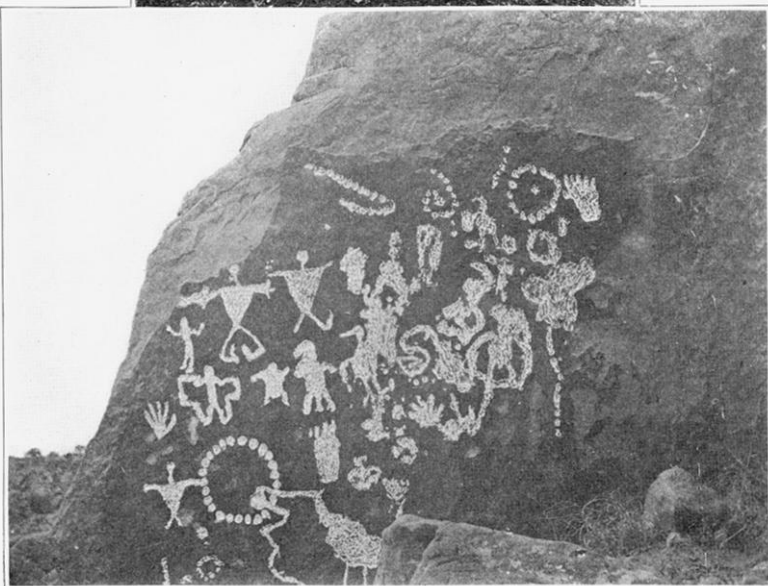
The next stream entering the Chin-lee from the east drains a high, arid valley at the foot of the upper end of Luckachucki Mountain, north and east of the Hospitito Spring and Los Gigantes Buttes. On the eastern wall of one of the main canyons in which this stream heads are several small ruins in caves. The buildings in these cliff caves are for the greater part small and inconspicuous. The general appearance of the caves and of the ruins, which have been "prospected" by several parties, is similar to those of the Cottonwood and Grand Gulch north of the San Juan in which the "basket makers'" relics have been found. The stream draining this region, so far as I know not hitherto named, I have called Hospitito Creek.

On the main Chin-lee stream, between the region near the mouth of Carriso Creek and the San Juan, are a few widely scattered

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1. SPIRAL FIGURES MADE ON A THIN COATING OF ADOBE ON A WALL OF A SHALLOW CAVE, GRAND GULCH, UTAH.

2. PETROGLYPHS ON A FALLEN ROCK IN COMPAÑERO CANYON, COLORADO.



ruins. About a mile above the entrance of Carriso Creek, at the bottom of the low cliffs which here border the valley, are several shallow caves in which are remnants of considerable buildings. The burials in these ruins have been to a moderate extent disturbed. For a few miles below the mouth of Carriso Creek the canyon is narrow and the walls precipitous, the surrounding country in the main being bare rock. A few miles below the bottom of the canyon widens, and there are several small ruins scattered along in low caves or as small valley sites. The situation of these is indicated on the map. Some of them are mentioned in Jackson's report.<sup>1</sup>

A couple of miles below the mouth of the Gothic Wash the Chin-lee turns abruptly northwest through a narrow break in the hills, and here, where the water when the stream is flowing falls over a high ledge, there is a considerable ruin on the edge of the cliff and a large cave ruin a few hundred yards to the north. There are several cave ruins and valley sites between this point and the mouth of the San Juan which have been described by Jackson. There are a few pictographs in the caves of the lower Chin-lee Valley. The burials in and near the ruins of this part of the valley have been extensively dug and large collections of pottery have been removed.

I have explored the entire length of the Gothic Wash, the main canyons in which it heads against the Carriso Mountains, and the neck between the latter and Luckachucki. In the lower reaches of the Gothic Wash there are a few small sites, none of them noteworthy either in size or character. It is not until one approaches the heads of the short, rough side canyons against the shoulder of the mountain that he finds many ruins. Here, as indicated on the map, and especially in the southernmost fork of the Gothic Wash, are numerous small cliff houses and a few bottom sites. The most noteworthy of the cliff houses is in a large cave close under the mountain, some eighty feet above the rough chasm and almost inaccessible. There are several small buildings here and a largely intact estufa with a still well-preserved wooden ladder leading down into it. This ruin had apparently remained undisturbed until a few days before our visit, when a Navaho had, by deepening the old steps in the rock, climbed up and disturbed one or two of the burials.

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<sup>1</sup> Loc. cit., p. 420.

There are numerous groups of pictographs along the upper reaches of the Gothic Wash, both upon the walls of the caves and upon the open faces of the cliffs. These are most abundant near the mouths of the side canyons which contain the ruins. In general the burials in this fork of the Gothic Wash have been but little despoiled. I found no evidence of noteworthy ruins in the northernmost forks of the Gothic Wash.

The great region between the Gothic Wash and the San Juan River and between the Chin-lee and Four Corners, where Utah, Arizona, Colorado, and New Mexico join, is extremely rough, arid, and bare. The black, jagged uplands are much cut with almost impassable gulches, the entire region having characters which apparently in no part of this country attracted the house-builders.

I have not explored the northern and northeastern slopes of Carriso Mountain, from which several short canyons issue. From apparently trustworthy sources I have heard of numerous small ruins here.

My attention was called some time ago by Charles Lang, who shared in the early excavations of the remains of the so-called "basket makers" in the Cottonwood, Butler Wash, and Grand Gulch regions north of the San Juan, to the general similarity to these of the caves and burials along the lower Chin-lee and upon the western slopes of the Carriso and Luckachucki in which he has made some superficial excavations — a similarity which seemed to me also evident. It will be interesting to learn definitely, when systematic excavations under proper auspices shall have been undertaken here, whether in fact the "basket-maker" burials may not be found in the caves along the Chin-lee and possibly also in the Canyon de Chelly.

#### RUINS OF THE MARSH PASS AND NAVAHO MOUNTAIN REGION

The great barren and broken country which lies between the Chin-lee and the high mesas on the west, save for a few small springs and a scanty flow of alkaline seepage in the Gypsum Valley, is almost wholly waterless. Here are the great sandy stretches which mark the Chin-lee desert, and over which fierce wind-storms sweep, carrying the sand far away in vast clouds and for hours, sometimes for days, scour and scourge the country for many miles.

In the picturesque Monument Valley, where the dwindling remnants of great red buttes stand up in a fantastic array of pinnacles and towers, there is no water in summer save one small trickle from beneath a crag in the great fault which runs from the San Juan to Marsh Pass. I have found no ruins in all this country, nor have I been able to learn of any from reliable Indians long resident upon the borders of this district.

There are a few small cliff houses along a little water-course which issues from a canyon in the northern face of the Te-en-ta Mesa. The meager arable patches in this canyon bottom are now tilled by Navahos.

There are a few small valley sites, considerably washed, beside the arroyo of the small stream which descends for a short distance northeastward from Marsh Pass.

There are numerous small valley sites, several cliff houses, and a few pictographs in the canyon of the To-wan-ah-a-che, which enters Marsh Pass from the northwest. The upper end of this valley is well watered from a series of bubbling springs, and below these the underground flow of the valley rises to the surface in several places, so that there is considerable arable land now cultivated by Navahos in the wider alluvial bottom.

There are no ruins along the old trail which runs from the head of the south arm of this canyon across the high divide to the group of fairly well-watered Indian farms near the head of Paiute Canyon.

As one climbs out of the Paiute Canyon from the Paiute and Navaho Indian farms, going westward, he comes upon the great undulating and in places rugged mesa, which lies between Paiute and West canyons<sup>1</sup> and the eastern base of Navaho Mountain (plate xxxvi, 1).

An old trail crosses this mesa and leads by a sharp ascent to the sacred spring of the Navahos, which bubbles out far up the eastern slope of the great dome. Within a couple of miles, I should judge, from the western rim of Paiute Canyon, and a few hundred

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<sup>1</sup> The canyon through which the stream called on the Government maps "Navajo Creek" runs to enter the Colorado River, is now generally called West Canyon. It is a rugged and tortuous gorge in the upper portion, and as it does not belong in the San Juan watershed I have not explored it. But it contains, as I am informed by Richard Wetherill and Charles Mason, who have entered it, a considerable number of interesting ruins.

yards to the south of the trail, is a ruin of considerable size on the edge of a low bluff and extending down the slope at the foot. The burial mound is undisturbed.

This Navaho Mountain region has been rarely visited by white men. The renegade Paiutes and Navahos who occupy the few inhabitable places are not friendly, owing to their antipathy to mineral hunters, and while the larger surveying or prospecting parties have not been seriously molested, individual explorers have not usually come back. Thus the burial mounds in this vicinity have remained intact.

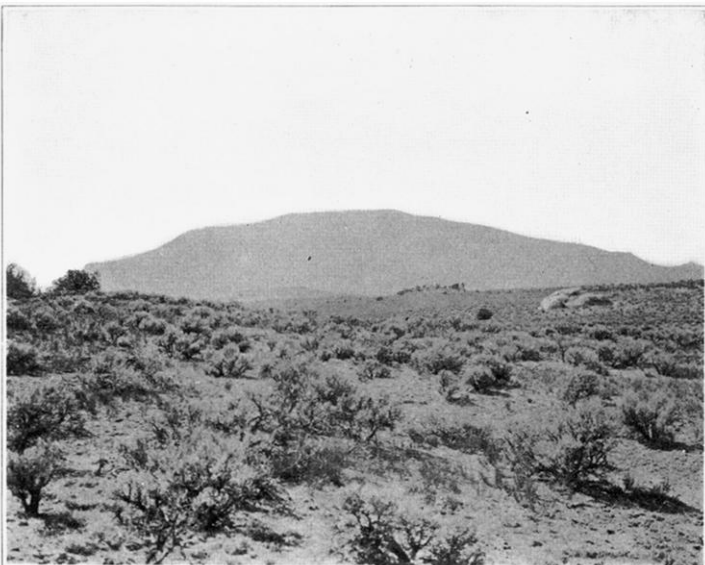
A few miles west of the Paiute Canyon and about half a mile to the north of the trail are two small fortified buttes (plate xxxvi, 2) with considerable fallen masonry about them, forming a mass about one hundred and thirty-five feet square: plan obscure, considerable pottery fragments. The burial mounds are not disturbed. Upon the same mesa, about a mile nearer the base of the mountain, is an isolated butte from twenty to thirty feet high and about ninety by sixty feet on the top, which is nearly covered with rooms. A series of rooms with circular estufas lie upon the eastern slope of the butte. The rooms on the top were apparently of one story and are arranged in a row along the more abrupt western edge of the rock. The stones are rough and carelessly laid. A considerable amount of broken pottery lies at the base of the eastern slope.

About one hundred yards southwest of this fortified rock, on a small knoll, is a closely clustered group of five ruins of the "unit type," the largest about one hundred feet long at the back. Each of the units of this group has its separate burial mound with much broken pottery, an unusual quantity of which is red. These ruins are considerably sand-covered.

Aside from the ruins just mentioned, I have found only one small house upon this mesa. This is about twenty-five feet square, and is near the trail several miles nearer the base of the mountain than the ruins last mentioned. Nor could I learn of any others from the Indians whose stock range this country. I could not discover evidences of habitation either near the spring or elsewhere on the eastern slope nor upon the summit of the mountain.<sup>1</sup> There

<sup>1</sup> The dome of Navaho Mountain is so low relatively to the size of its base that the view from the actual summit is limited to a few distant glimpses across the low timber

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1. NAVAHO MOUNTAIN, FROM THE PLATEAU WEST OF PAIUTE CANYON.
2. FORTIFIED ROCKS ON THE PLATEAU SOUTHEAST OF NAVAHO MOUNTAIN.

is no permanent water on the mesa between the head of Paiute Canyon and the spring upon the eastern slope.

I have not explored Paiute Canyon nor the rough, broken country which lies north and east of the mountain toward the lower reaches of the San Juan. But from the Indians and from miners who have explored this region, I have heard of only a few small cliff houses in one of the gorges entering the San Juan east of Paiute Canyon.

#### ACCESS TO THE VARIOUS GROUPS OF RUINS IN THE SAN JUAN WATERSHED

I have indicated on the map the more important of the trails and wagon roads of this great district, especially those by which the groups of ruins may be most readily reached.

The part of the region embraced in the Navaho reservation and the adjacent country is traversed in all directions by innumerable Indian trails, some good, some very bad indeed. Some of these which I have traveled and thus have personal knowledge of, are located on the map in accordance with the old Government surveys. Many of the newer roads have been indicated from my own knowledge of them alone, as they have neither been surveyed nor before located upon a map. They may not therefore be quite accurately placed, but are sufficiently so to serve as guides for travel.

Well traveled roads traverse the lower Animas and La Plata valleys and pass close to most of the ruins along these bottoms. The Mesa Verde and the great region westward from this and north of the San Juan are most conveniently reached from Mancos, Colorado, which is on the southern narrow-gauge loop of the Denver and Rio Grande Railroad. A rough wagon track has been made down the Mancos Valley to the mouth of Cliff Canyon, out of which one may scramble on to the mesa near the so-called Cliff Palace and the Balcony House.<sup>1</sup> But for a thorough exploration of the Mesa Verde it is best to obtain pack-animals at Mancos, from which one may reach the nearest of the great cliff houses in a day.

Several days will be required to visit all the noteworthy ruins down the line of shallow gulches which furrow its sides. But from a series of rocky spurs which come out from all sides somewhat below the summit level one may gain wide views of the desolate and tenantless region which this mountain dominates.

<sup>1</sup> See Nordenskiöld, *Cliff Dwellers of the Mesa Verde*.

on the Mesa which are reached by obscure and tortuous trails. The numerous valley sites along the Mancos Canyon are accessible only on horseback.

A wagon road from Mancos or Cortez traverses McElmo Canyon, and from this the various side canyons and the tributaries of the Yellowjacket are accessible only by trails, except Ruin Canyon, up which a wagon road runs for a short distance.

The great groups of Montezuma Creek, Recapture, Cottonwood, Butler, Comb, and Grand Gulch may be reached from Bluff City as a base. It is necessary to have pack-animals for these trips. The trails are rough, and competent guides are necessary for one unfamiliar with the country. Bluff City may be reached by a wagon road over which there is at present considerable travel. This leaves the McElmo Canyon road at the Yellowjacket, bears over the high mesas, crossing Montezuma and Recapture creeks, and reaches the San Juan at Bluff. Bluff City may also be reached by a road from Monticello which follows down the high mesas east and south of the Abajo Mountain. This road I have not indicated on the map.

One should not suffer for water in this northern San Juan district even in summer, though it is often scanty and hard to find.

The San Juan Valley is traversed by a wagon road, in some places passable, in others not, from the mouth of Canyon Largo to the mouth of Comb Wash. But here also one is much more certain of progress when on horseback with a pack-train.

The great Chaco ruins are now most easily reached by a new wagon road made by the Hyde Exploring Expedition, which runs from Thoreau on the Santa Fé railroad, northward. This is about seventy miles. A wagon road from Albuquerque, by way of the Rio Puerco of the East and La Posta, enters the head of the Chaco Valley and follows down the wash past the Pintado ruin to the main group below. The ruins are however much farther from the railroad at Albuquerque than at Thoreau.

From Farmington and from Bloomfield on the San Juan wagon roads lead across the high mesas to the Chaco ruins. At present (1903) Richard Wetherill maintains an Indian trading-post near the great Pueblo Bonito, and in the little settlement which has formed



about this are a small hotel and accommodations for stock. A post office — Putnam — is now located here.

The mouth of Canyon de Chelly, where a trading post is maintained, may be reached from Gallup by way of Fort Defiance. From Fort Defiance also one may follow the high-line mountain road northward to the trading-post at Chee's, on Carriso Creek, from which as a base the Hospitito, Gothic Wash, and Carriso Creek groups may be explored.

The Marsh Pass and Navaho Mountain region may be reached from Chee's by Indian trails, but the route is very hot and dry in summer, as is nearly all of the Chin-lee Valley save near the bases of the mountains. Navaho Mountain may be reached from Bluff City in four or five days of hard and thirsty travel along the rough Indian trails crossing or skirting the picturesque Monument Park.

There is a wagon road over the Tunitcha-Luckachucki range at Cottonwood Pass, so that one can now drive across from the Chaco to the Chin-lee valleys.

I have not indicated the springs and water-holes upon the map, because many of these frequently fail in summer, and one who in this respect should rely upon map indications would be liable to come to grief. Nor do the lines of the water-courses, save in the high mountains, give any reliable indication of water available for the traveler.

It should be assumed that any one not familiar with desert travel and with the details of these particular desert regions will not venture unattended away from the few main routes. For limited regions which he knows, a reliable Navaho Indian (if he respects you, which is by no means to be taken for granted if you are a white man) may be an excellent guide, so far as water and trails are concerned. But it is wiser in the longer trips to secure the coöperation of a good frontiersman who can be trusted to manage stock wisely under the many vicissitudes of this rough and barren land, and to use the Indians only as local water and path finders and trailers of the animals which may wander off at night when water and forage are scanty.

It may be said in conclusion that, on the whole, one is much more independent and certain to accomplish his aims who travels on

horseback with a pack-train, while in a large part of the region this is quite indispensable.

The Indian trading-posts both on and off the Navaho reservation are of the greatest service to the wandering archeologist, since he is certain to find water there, usually feed for stock, and replenishment for his own larder. Those which are likely to be most important in this respect are maintained at present (1903) at the great Chaco ruins ; at Tiz-na-zin and Gray Hills in the Chaco watershed ; at the mouth of the Canyon de Chelly, and at Chee's in the Chinlee Valley. There are stores also at Thoreau, at Farmington, at Jewett, and at Bluff. There are other trading posts on and off the reservation, as indicated on the map ; but from their situation these are less likely to be useful to the ruin hunter than those above named.

#### VANDALISM

It will be seen from the notes on the various groups of ruins in the San Juan watershed that great injury has been wrought to the interests of archeology by the widespread, unlicensed, random digging among the ruins and burials. This is still going on in many places, and latterly, the Navaho Indians having overcome their superstitious dread of these old relics of mortality and stimulated by unscrupulous purveyors of bric-a-brac, are working havoc in many regions which have hitherto escaped.

In the early days, before the problems connected with these ruins had become clear and definite, the simple collection of pottery and other utensils was natural and not without justification. But it is now evident that to gather or exhume specimens — even though these be destined to grace a World's Fair or a noted museum — without at the same time carefully, systematically, and completely studying the ruins from which they are derived, with full records, measurements, and photographs, is to risk the permanent loss of much valuable data and to sacrifice science for the sake of plunder.

It is to be hoped that steps may soon be taken to protect these relics of a most instructive phase of primitive culture, and that authorized and intelligent research may be encouraged to enter a field still full of the promise of most interesting discovery.